CAROLINA

graduate school

The UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

2002-2004 RECORD
The Graduate School

Record of
The University of North Carolina
at Chapel Hill
2002-2004

August 2002

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With this issue, the printed Graduate Record will go to a two-year publishing schedule. The next printed version of the Record will appear in August, 2004; however, the online version will be updated annually. For the most current information, please refer to the online Record at www.unc.edu/gradrecord. In instances of discrepancy between the printed and online Records, the online version takes precedence.
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2002-2004
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To Graduate Students and Prospective Graduate Students

The University of North Carolina at Chapel Hill is one of the leading graduate research universities in the United States. As one of the most comprehensive in the nation, it provides a breadth of study and experience matched by few institutions. There are sixty-five doctoral-level programs and eighty-five master's-level programs currently active in the Graduate School.

This Record provides basic information about these programs. It includes our admission standards and requirements, tuition and other costs, sources of financial aid including fellowships, and information concerning research institutes and centers as well as brief program and course descriptions. In addition, you will find under each program description a listing of all graduate faculty in that area together with their specific research interests.

The University of North Carolina at Chapel Hill believes that academic excellence is enhanced by the maintenance of a community that includes people from a wide range of ethnic, racial, socio-economic, and geographic backgrounds, as well as individuals whose personal attributes will contribute to a richer learning environment. The University is committed to equality of educational opportunity.

In addition to the resources represented by an outstanding faculty, an outstanding research library, and other outstanding facilities, the University has a warm and collegial spirit that is conducive to personal growth and scholarship.

By attending this institution you are becoming an important part of a 200-year-old tradition of excellence in scholarship, research, teaching, and public service. We hope that your time here is fruitful, challenging, and rewarding.

The Graduate School
Mission Statement:
The University of North Carolina at Chapel Hill

The University of North Carolina at Chapel Hill has been built by the people of the State and has existed for two centuries as the nation's first state university. Through its excellent undergraduate programs, it has provided higher education to ten generations of students, many of whom have become leaders of the state and the nation. Since the nineteenth century, it has offered distinguished graduate and professional programs.

The University is a research university. Fundamental to this designation is a faculty actively involved in research, scholarship, and creative work, whose teaching is transformed by discovery and whose service is informed by current knowledge.

The mission of the University is to serve all the people of the State, and indeed the nation, as a center for scholarship and creative endeavor. The University exists to teach students at all levels in an environment of research, free inquiry, and personal responsibility; to expand the body of knowledge; to improve the condition of human life through service and publication; and to enrich our culture.

To fulfill this mission, the University must:

• provide high-quality undergraduate instruction to students within a community engaged in original inquiry and creative expression, while committed to intellectual freedom, to personal integrity and justice, and to those values that foster enlightened leadership for the State and the nation;
• acquire, discover, preserve, synthesize, and transmit knowledge;
• provide graduate and professional programs of national distinction at the doctoral and other advanced levels to future generations of research scholars, educators, professionals, and informed citizens;
• extend knowledge-based services and other resources of the University to the citizens of North Carolina and their institutions to enhance the quality of life of all people in the State; and
• address, as appropriate, regional, national, and international needs.

This mission imposes special responsibilities upon the faculty, students, staff, administration, trustees, and other governance structures and constituencies of the University in their service and decision making on behalf of the University.
The UNC System
History of the University

In North Carolina, all the public educational institutions that grant baccalaureate degrees are part of the University of North Carolina. The University of North Carolina at Chapel Hill is one of sixteen constituent institutions of the multicampus state university.

The University of North Carolina, chartered by the North Carolina General Assembly in 1789, was the first public university in the United States to open its doors and the only one to graduate students in the eighteenth century. The first class was admitted in Chapel Hill in 1795. For the next 136 years, the only campus of the University of North Carolina was at Chapel Hill.

In 1877 the North Carolina General Assembly began sponsoring additional institutions of higher education, diverse in origin and purpose. Five were historically Black institutions, and another was founded to educate American Indians. Several were created to prepare teachers for the public schools. Others had a technological emphasis. One is a training school for performing artists.

In 1931 the North Carolina General Assembly redefined the University of North Carolina to include three state-supported institutions: the campus at Chapel Hill (now the University of North Carolina at Chapel Hill), North Carolina State College of Agriculture and Engineering at Raleigh (now North Carolina State University at Raleigh), and the North Carolina College for Women (Woman's College) at Greensboro (now the University of North Carolina at Greensboro). The new multicampus University operated with one board of trustees and one president. By 1969, three additional campuses had joined the University through legislative action: the University of North Carolina at Charlotte, the University of North Carolina at Asheville, and the University of North Carolina at Wilmington.

In 1971 the General Assembly passed legislation bringing into the University of North Carolina the state's ten remaining public senior institutions, each of which had until then been legally separate: Appalachian State University, East Carolina University, Elizabeth City State University, Fayetteville State University, North Carolina Agricultural and Technical State University, North Carolina Central University, North Carolina School of the Arts, Pembroke State University, Western Carolina University, and Winston-Salem State University. This action created the current sixteen-campus University. In 1985 the North Carolina School of Science and Mathematics, a residential high school for gifted students, was declared an affiliated school of the University.

The UNC Board of Governors is the policy-making body legally charged with "the general determination, control, supervision, management, and governance of all affairs of the constituent institutions." It elects the president, who administers the University. The thirty-two voting members of the board are elected by the General Assembly for four-year terms. Former board chairmen and board members who are former governors of North Carolina may continue to serve for limited periods as nonvoting members emeriti. The president of the UNC Association of Student Governments, or that student's designee, is also a nonvoting member.

Each of the sixteen constituent institutions is headed by a chancellor, who is chosen by the Board of Governors on the president's nomination and is responsible to the president. Each institution has a board of trustees, consisting of eight members elected by the Board of Governors, four appointed by the governor, and the president of the student body, who serves ex officio. (The North Carolina School of the Arts has two additional ex officio members.) Each board of trustees holds extensive powers over academic and other operations of its institution on delegation from the Board of Governors.
The University of North Carolina: Sixteen Constituent Institutions

| Appalachian State University           | University of North Carolina at Asheville  |
| www.appstate.edu                       | www.unca.edu                             |
| East Carolina University               | University of North Carolina at Chapel Hill|
| www.ecu.edu                            | www.unc.edu                              |
| Elizabeth City State University        | University of North Carolina at Charlotte |
| www.ecsu.edu                           | www.uncc.edu                              |
| Fayetteville State University          | University of North Carolina at Greensboro|
| www.unfsw.edu                          | www.uncg.edu                              |
| North Carolina Agricultural            | University of North Carolina at Pembroke  |
| and Technological State University     | www.uncp.edu                              |
| www.ncat.edu                           | University of North Carolina at Wilmington|
| North Carolina Central University      | www.uncw.edu                              |
| www.ncsu.edu                           | Western Carolina University               |
| North Carolina School of the Arts      | www.wcu.edu                               |
| www.ncoarts.edu                        | Winston Salem State University            |
| North Carolina State University        | www.wssu.edu                              |
Board of Governors
The University of North Carolina

Benjamin S. Ruffin
Chair
8 West Third Street, Suite 575
Winston-Salem, NC 27101
Bus: 336/725-1311
Res: 336/945-6768
Fax: 336/725-1313

John F.A.V. Cecil
Vice Chair
Post Office Box 5355
Asheville, NC 28813
Res: 828/264-2278
Fax: 828/264-2150

G. Irvin Aldridge
Secretary
341 Mother Vineyard Road
Manteo, NC 27954
Res: 252/473-2207
Fax: 252/473-9394

Bradley T. Adcock
Blue Cross & Blue Shield of NC
Post Office Box 2291
Durham, NC 27702
Bus: 919/765-4119
Res: 919/469-2583
Fax: 919/765-2432

James G. Babb
600 Ardsley Road
Charlotte, NC 28207
Bus: 704/632-6725
Res: 704/375-9710
Fax: 704/347-5280

J. Addison Bell
Post Office Box 1395
Matthews, NC 28106
Bus: 704/847-4406
Res: 704/343-9712
Fax: 704/844-2755

F. Edward Broadwell Jr.
Post Office Box 10
Asheville, NC 28802-0010
Bus: 828/259-3939, Ext. 1360
Res: 828/274-1099
Fax: 828/259-3956

William T. Brown
1840 Broadell Drive
Perryville, NC 28301
Res: 910/488-5423
Fax: 910/480-0292

Angela R. Bryant
717 West End Street
Rocky Mount, NC 27803
Res: 252/442-4022
Fax: 703/783-6553

William L. Burns Jr.
Post Office Box 931
Durham, NC 27702
Bus: 919/683-7600
Res: 919/477-1812
Fax: 919/683-7680

C. Clifford Cameron
1970 Two First Union Center
Charlotte, NC 28288-0016
Bus: 704/374-6470
Res: 704/364-4434
Fax: 704/338-9539

Anne W. Cates
329 Tenney Circle
Chapel Hill, NC 27514
Res: 919/942-2161
Fax: 919/932-1716

Bert Collins
411 W. Chapel Hill Street
Mutual Plaza
Durham, NC 27701
Bus: 919/682-9201, Ext. 201
Res: 919/471-1611
Fax: 919/688-0842

John W. Davis III
200 W. 2nd Street, Suite 500
Winston-Salem, NC 27101
Bus: 336/727-4288
Res: 336/761-8124
Fax: 336/761-7276

Ray S. Farris
Johnston, Allison & Hord
Post Office Box 36469
Charlotte, NC 28236
Bus: 704/998-2223
Res: 704/377-1113
Fax: 704/376-1628

Dudley E. Flood
1408 Griffin Circle
Raleigh, NC 27610
Res: 919/832-7095
Fax: 919/832-6987

Hannah D. Gage
6046 Leeward Lane
Wilmington, NC 28409
Res: 910/256-9375
Fax: 910/256-6929
Willie J. Gilchrist  
Post Office Box 468  
Halifax, NC 27839  
Bus: 252/583-5111  
Res: 252/826-3999  
Fax: 252/583-1474

Andrew Payne  
(Ex Officio)  
307 Witherspoon Student Center  
NCSU, Campus Box 7318  
Raleigh, NC 27695-7318  
Bus: 919/515-2797  
Cell: 919/649-7570  
Fax: 919/515-5898

Barbara S. Perry  
Post Office Box 1475  
Kinston, NC 28503  
Bus: 252/523-5107  
Res: 252/523-9310  
Fax: 252/523-8858

Patsy B. Perry  
2204 Chase Street  
Durham, NC 27707  
Res: 919/493-8471  
Fax: 919/493-8471

Jim W. Phillips Jr.  
Post Office Box 26000  
Greensboro, NC 27420  
Bus: 336/271-3131  
Res: 336/272-3821  
Fax: 336/378-1001

H. D. Reaves Jr.  
104 Cameron Glen Drive  
Chapel Hill, NC 27516  
Res: 919/932-1953  
Fax: 919/932-7980

Gladys Ashe Robinson  
Post Office Box 20964  
Greensboro, NC 27420  
Bus: 336/274-1507  
Res: 336/674-8086  
Fax: 336/274-4251

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5109 Bur Oak Circle  
Raleigh, NC 27612  
Bus: 919/782-3827  
Res: 919/876-6947  
Fax: 919/787-8418

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700 Gimghoul Road  
Chapel Hill, NC 27514  
Bus: 336/274-3541  
Res: 919/932-1360  
Fax: 336/272-8153

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Post Office Box 1730  
Wilmington, NC 28402  
Bus: 910/762-9671  
Res: 910/350-0426  
Fax: 910/762-9206

J. Bradley Wilson  
Post Office Box 2291  
Durham, NC 27702-2291  
Bus: 919/765-3558  
Res: 919/678-1344  
Fax: 919/765-7818

Ruth Dial Woods  
220 Carter Morgan Road  
Pembroke, NC 28372  
Res: 910/521-9006  
Fax: 910/521-9305
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Durham, NC 27701
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Scoatland Neck, NC 27874
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(704) 365-2711

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Charlotte, NC 28202
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(704) 372-2040 Fax 372-1040

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404 Wildwood Avenue
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(252) 937-2464 Fax (252) 443-7997

132 Lochwood West
Cary, NC 27511-8301
(919) 851-1177 Fax 233-4352

Jennifer A. Daum
Ex-Officio Member
Student Body President
Student Government, UNC-Chapel Hill
Box 47, CB #5210, Carolina Union
Chapel Hill, NC 27599-5210
(919) 962-5202

Brenda Kirby
Assistant Secretary
UNC-Chapel Hill
Chancellor's Office
CB #9100, 103 South Building
Chapel Hill, NC 27599-9100
(919) 962-1365 Fax 962-1647
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Record of the 2001 Academic Year

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Mary P. Schleisman, J.D., Associate University Counsel
Joanna Carey Smith, J.D., Associate University Counsel
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Steve Condlin, J.D., University Property Officer
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Historically Underutilized Businesses (HUB) Coordinator
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Jim Mergner, M.S., Deputy, Facilities Services
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Pam Barkett, M.S., Director, Employment
Judy Sladen, B.A., Director, Payroll Temps

1. Title change, effective 1 January 2002
2. Effective 1 June 2001
3. Position reports to University Counsel
4. Effective 24 October 2001
5. Position reports to Vice Chancellor for Research and Graduate Studies, effective 21 December 2001
6. Reassigned, effective 24 August 2001
7. Effective 1 January 2002
8. Effective 24 October 2001
10. Title change, effective 1 August 2001
11. Position reports to Associate Vice Chancellor, Finance, effective 1 August 2001
12. Title change, effective 1 July 2001
13. Reporting line change, effective 1 August 2001
14. Reporting line change, effective 1 August 2001
15. Reporting line change, effective 1 August 2001
16. Reporting line change, effective 1 August 2001
18. Effective 11 September, 2001
19. Effective 1 August 2001
20. Retired, 20 June 2001
21. Effective 1 August 2001
22. New Position, effective 9 January 2002
23. Position eliminated, 31 May 2001
24. Position eliminated, 31 December 2001
25. Position reports to Associate Vice Chancellor, Campus Services, effective 1 August 2001
26. Position reports to Associate Vice Chancellor, Campus Services, effective 1 August 2001
27. Retired, 16 February 2001
28. Effective 17 February 2001
29. Effective 30 July 2001
30. Position reports to Associate Vice Chancellor, Campus Services, effective 1 August 2001
31. Position reports to Associate Vice Chancellor, Campus Services, effective 1 August 2001
32. Effective 25 June 2001
Joe Totten, J.D., Director, Counseling Service
Jerry Howerton, M.P.A., Director, Position Management
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Connie Boyce, Director, Employee Records
Martha McDaniel, Director, Compensation Services
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Barbara DeLone, Director, Employee Services
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Brenda Glover, Interim Director, Benefits
Sharon Pasley-Nieves, B.A., Network Coordinator
Judith Scott, M.A., Sexual Harassment Officer
Chris Chiron, M.A., Communications Coordinator
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Lynn Williford, Interim Director of Institutional Research
Archie W. Ervin, Ph.D., Assistant to the Chancellor and Director for Minority Affairs
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Lisa Soeters, M.A., Director, Carolina Parents Office
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Jay Anhorn, M.A., Director, Office of Greek Affairs
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Elmira Mangum, Ph.D., Associate Provost for Finance

Barron S. Mattherly, B.S., Assistant Provost for Finance

Linda S. Carl, Ph.D., Assistant Provost for Educational Programs

David C. Lanier, M.S., Assistant Provost and University Registrar

Lynn Willford, Assistant Provost and Director, Institutional Research

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Martha Cox, Ph.D., Director, Center for Developmental Sciences

Lawrence G. Rowan, Ph.D., Director, Center for Teaching and Learning

Norman H. Loewenthal, M.Ed., Director, The William and Ida Friday Center for Continuing Education

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Holden H. Thorp, Ph.D., Director, Morehead Planetarium

Peter White, Ph.D., Director, North Carolina Botanical Garden

James L. Murphy, Ph.D., Dean, Summer School

Gerry M. Madrazo Jr., Ph.D., Director, Mathematics and Science Education Network

Scott R. Daugherty, J.D., Executive Director, Small Business and Technology Development Center

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William H. Glaze, Ph.D., Director, Carolina Environmental Program

Harry L. Watson, Ph.D., Director, Center for the Study of the American South

Harry Antana, M.A., Acting Director, Institute of African American Research

William A. Darity Jr., Ph.D., Director, Institute of African American Research

Harry Antana, M.A., Acting Director, Sonja Haynes Stone Black Cultural Center

Joseph F. Jordan, Ph.D., Director, Sonja Haynes Stone Black Cultural Center

Marsha S. Collins, Assistant Provost for Women's Issues

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Lynn W. Blanchard, Ph.D., Director, Carolina Center for Public Service

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Karen M. Gil, Ph.D., Senior Associate Dean, Undergraduate Education

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Fred Clark, Ph.D., Associate Dean, Academic Services

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Joanne G. Marshall, Ph.D., Dean, School of Information and Library Science

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Jack M. Richman, Ph.D., Interim Dean, School of Social Work

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Alan W. Cross, M.D., Director, Center for Health Promotion and Disease Prevention

Timothy S. Carey, M.D., Director, Cecil G. Sheps Center for Health Services Research

Carol Jenkins, M.L.S., Director, Health Sciences Library

52 Title change, effective 1 October 2001
53 Effective 1 June 2001
54 Effective 1 July 2001
55 Title change, effective 1 October 2001
56 Effective 1 July 200157 Title change, effective 1 February 2002
58 Reopened, 1 June 2001
59 Effective 1 July 2001
60 Reopened, 1 July 2001
61 Effective 1 August 2001
62 Reopened, 1 June 2001
63 Effective 1 July 2001
64 Reopened, 1 August 2001
65 Effective 15 August 2001
66 Reopened, 1 June 2001
67 Effective 1 July 2001 - 1 January 2002
68 Effective 1 January 2002
69 Reopened, 1 August 2001
70 Effective 1 November 2001
71 Effective 1 July 1999
72 Reopened, 1 November 2001
73 Effective 1 January 2002
74 Title change, facility name change, 1 October 2001
75 Position report to Vice Chancellor for Research and Graduate Studies, effective 13 August 2001
76 Reopened, 1 June 2001
77 Position report to Vice Chancellor for Research and Graduate Studies, effective 1 August 2001
78 Position report to Vice Chancellor for Research and Graduate Studies, effective 1 August 2001
79 Position report to Vice Chancellor for Research and Graduate Studies, effective 1 August 2001
The University of North Carolina at Chapel Hill
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* Terms expire July 31 of the year indicated.

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The Chancellor and the Provost also are ex officio members of the Board.

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Arne L. Kalleberg, Ph.D., M.S., Senior Associate Dean
Vacant, Associate Dean for Recruitment and Special Projects
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Jameel Freeman, Recruitment and Special Projects Assistant
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Arne Kalleberg, Senior Associate Dean

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John Sellers, Manager, Information Office
Cheryl Thomas, Director, Admissions and Student Records
Vacant, Director, Graduate Support Services
Vacant, Associate Dean for Recruitment and Special Projects
Vacant, Student Services, Admissions
Vacant, Student Services, Enrolled Students Office
The University of North Carolina at Chapel Hill
General Information

History
The University of North Carolina at Chapel Hill was the first state university to admit students. It was chartered in 1789 and formally opened in 1795; from early in its history, it has encouraged research and creative activity.

As early as 1853-54 the catalog of the University carried an announcement of graduate course work. In 1876, after the institution had been closed for the period 1871-75, the catalog announced the requirements for the master's degree, and the next issue carried an announcement of regulations governing the degrees of master of arts, master of science, and doctor of philosophy. Several graduate degrees were awarded before the turn of the century; the first degree of doctor of philosophy being conferred in 1883, but it was not until 1903 that a separate graduate school with a dean was established.

In 1920, from an earlier advisory committee, the Administrative Board of the Graduate School was organized. In 1922, the graduate faculty voted, first, to vest in the Administrative Board legislative powers in matters that affected graduate education; second, to authorize the Administrative Board to admit members to the teaching faculty of the Graduate School; and, third, to vest in the Administrative Board the responsibility for authorizing curricula and courses carrying graduate credit. At present, the board consists of nineteen members appointed by the chancellor upon nomination by the dean of the Graduate School.

With the exception of the Master of Business Administration, the Master of Accounting, the Master of School Administration (M.S.A.) degree in Educational Leadership, and the Doctor of Education (Ed.D.) degree program in Educational Leadership, all master's degrees offered by the University and the degrees of Doctor of Philosophy, Doctor of Education, Doctor of Audiology, and Doctor of Public Health are conferred by the Graduate School.

Organization
Work toward advanced degrees in the University of North Carolina at Chapel Hill proceeds under policies and regulations established by the graduate faculty. The immediate direction of the Graduate School is in the charge of the Administrative Board, of which the dean is chair, consisting of members of the faculty representing a variety of disciplines.

The Summer School
The University of North Carolina at Chapel Hill established what was possibly the first summer school in America in 1877. The "Summer Normal School," as it was then called, enrolled two hundred thirty-five students in courses over ten different disciplines. About half the students were teachers; students came from forty-two counties across North Carolina and from some neighboring states. The Summer School was first to enroll women as university students and continued this equal admission throughout its history. By 1925, records indicate that 19,983 students had enrolled in Summer School.

Curricula and courses that are offered during the Summer School are comparable to those of the fall and spring semesters. The Summer School is divided into two regular sessions of five and one-half weeks each and a special session that includes short courses, institutes, workshops, etc., with various beginning and ending dates. The summer program is planned to meet the needs of graduate students who are fulfilling degree requirements in this institution, visiting graduate students who desire to take courses for transfer to other institutions, teachers and administrators who desire to meet state certification requirements, and other students who have special educational objectives.

Graduate students who wish to be admitted or readmitted in the Summer School to a degree program should write to the dean of the Graduate School. The requirements for admission to a degree program starting in the summer are the same as those in the regular academic year. Those who desire a copy of the Summer School Catalog, or other information, and those wanting to enroll in the summer as visiting students should visit the Summer School's web page at www.unc.edu/depts/summer or write to the dean of the Summer School, The University of North Carolina at Chapel Hill, CB# 3340, 134 East Franklin Street, Room 200, Chapel Hill, NC 27599-3340, or telephone (919) 966-4364; fax (919) 962-2752.

Visiting Scholars
Registration as a Visiting Scholar at the University of North Carolina at Chapel Hill entitles the registrant to certain privileges of the University, the issuance of a UNC One Card, and the use of University facilities for the duration of the visitor's stay.

Eligibility for registration as a Visiting Scholar is limited to those who
1. are not on the University payroll as employees in any capacity and
2. are visiting the University under the sponsorship of an academic department or school for the furtherance of scholarly interests.

Visiting Scholars may include faculty members on leave from other institutions of higher learning, postdoctoral fellows, or others who hold the terminal degree in their fields and are invited to visit by a department or school.

Persons interested in applying for Visiting Scholars status should communicate with the appropriate department or school within the University. Further details concerning University privileges for Visiting Scholars are available from the EPA/Faculty Benefits Office, CB# 1045, 725 Airport Road, Chapel Hill, NC 27599-1045.

The University Year
Two semesters of approximately seventeen weeks each and a summer school consisting of two sessions, each five and one-half weeks long, constitute the University year. The requirements for admission to graduate programs and for graduate degrees in the summer session are the same as those in the regular academic year. For the schedule of events of particular interest to graduate students, consult the Academic Calendar of Events in this catalog.
Admissions and Financial Information

General Admissions Information

Application
Application for admission can be made online at gradschool.unc.edu. Inquiries concerning admission should be directed to one of the following:

Internet: gradschool.unc.edu
Email: gradinfo@unc.edu
Mail: The Graduate School
University of North Carolina at Chapel Hill
CB# 4010, 200 Bynum Hall
Chapel Hill, NC 27599-4010
Phone: (919) 966-2611
Fax: (919) 966-4010

Admission Criteria
Admission is highly competitive, and students are selected on the basis of their preparation and ability. With the exception of the Medical Allied Health Professions, where 75 percent of applicants offered admission must be North Carolina residents, there are currently no residency quotas for admissions. Applicants are eligible to apply if they have, or will complete prior to starting graduate study, an undergraduate degree from an appropriate college or university, or its international equivalent (based on a four-year curriculum), with an average grade of B or better for the last two years of study. Meeting this minimum requirement, however, does not ensure admission.

Application Due Dates
Complete fall applications are due December 1 for applicants who wish to be considered for Graduate School funding. Some programs may elect to continue receiving applications past this date. If so, they will establish a later application deadline and their applicants will be eligible for program-based funding. Please contact the program to which you are applying for specific deadline information. Students seeking admission for the spring semester should file applications no later than October 15 (September 15 for international applicants).

Application Fee
Applications must be accompanied by a non-refundable $60 fee for each program. The fee can be paid online by credit card, or by personal check or money order (international applicants use international money order) — no cash — made payable to the University of North Carolina at Chapel Hill. Applications submitted without the required fee will remain on file, unprocessed. If someone submits payment for you, please make sure your name is clearly noted as the intended applicant.

Application Fee Waiver
Fee waiver requests are considered for U.S. citizens who (1) are currently enrolled in a degree program with no breaks in enrollment from the point of entry at the undergraduate level, (2) are currently receiving need-based aid, and (3) have had no breaks in financial support since the onset of the support. An original letter (not a form letter) from a financial aid officer is required, verifying items 1, 2, and 3 above. The Graduate School is unable to waive the application fee for international applicants.

Application Status
Notification that an application was received will be sent once the application is processed. The status of an application may be monitored via the Graduate School's website. Since much of the required supporting material for applications is sent directly to the intended program, please direct all inquiries concerning receipt of those materials (i.e., "completeness" of application) to that office.

Decision Notification
Although individual programs may notify applicants of their recommendation regarding admission, official notification of the decision will come directly from the Graduate School. As a member of the Council of Graduate Schools, the UNC Graduate School has agreed to honor the April 15 deadline applicants are given for responding to offers of admission. Every effort will be made to give sufficient notice regarding admission decisions prior to this deadline. Where an early decision is not possible, applicants can expect final notification regarding their application no less than two months before the beginning of the relevant semester.

Major/Degree Intent
Some graduate programs offer the master's degree only (i.e., terminal master's) while others offer both master's and doctoral degrees, and occasionally the doctoral degree only. Programs that offer the doctoral degree vary in admission practice; some admit students without a master's degree directly into their doctoral program while others require initial enrollment at the master's level. Consult with the intended program regarding appropriate degree intent to specify on the application. An individual who wishes to enroll in a specific program without pursuing a degree may apply for admission as a non-degree student. Enrollment at this status is limited to one year. If the student is later admitted to a degree program, credit earned while the student is in the non-degree status is subject to the transfer credit limits described later.

Provisional Admission
The Graduate School does not offer provisional admission.

Term of Entry
Most programs admit students for the fall semester only. Some programs allow spring admission and a few begin in one of the summer sessions. Contact the intended program for the appropriate term of entry for the application. Registration for that term is required. Admission is only valid for the term stated in the admission letter. Policies regarding deferment vary by program. The Graduate School will, upon the program's recommendation, defer admission once (for up to one year) without requiring reapplication.
Time-to-Degree Limitations
A master's student has five years from the date of first enrollment at the master's level to complete the degree. A doctoral student has eight years from first enrollment at the doctoral level to complete the degree.

Transfer of Credit
Upon recommendation of the major program, and approval of the Graduate School, a master's student may transfer a maximum of 20 percent of total credit hours required for the degree from another accredited institution or from courses taken at this institution prior to admission to a degree program in the Graduate School (e.g., non-degree student, Continuing Studies, Summer School, etc.). Upon recommendation of the major program, and approval of the Graduate School, a doctoral student may transfer an unlimited amount of credit from another accredited institution. No doctoral credit may be transferred from an institution that gives the master's degree as its most advanced degree. All work, whether taken at this university or transferred from elsewhere, is held in the same regard, and students will be accountable for the contents. Transfer credits do not reduce the minimum residence requirements for either master's or doctoral students (two and four semesters, respectively). Correspondence courses are not accepted for graduate credit at this institution. Inquiries regarding the transfer of graduate credit should be directed to the individual program or department.

Required Application Material
The admission process is designed to collect credentials that will help determine which applicants have the academic preparation, intellectual ability, experience, and motivation to undertake a rigorous program of study. The application materials of each prospective student receive individual attention and thorough review by the intended program. In addition to the application itself, the following official documents must be submitted before an application can be considered complete and ready for evaluation by the intended program. All material submitted as part of an application becomes a part of the University's official record and cannot be returned.

Letters of Recommendation
Three letters of recommendation from persons qualified to evaluate an applicant's academic and professional qualifications are required. Recommendations should be requested from individuals who are familiar with the applicant's academic achievement and potential. Recommendations from former professors are preferred, but letters from other individuals who can address an applicant's achievement and potential will be accepted. The recommendations should be returned in a sealed envelope, with the recommender's signature over the flap, for submission with the application materials to be sent directly to the intended program. Although it is extremely helpful if these letters are sent with the program material, some recommenders prefer to send letters separately. They need to be informed of the appropriate application deadline so that they can submit the recommendation before that date.

Transcripts
Two official transcripts of all post-secondary (after high school) education, bearing the signature of the registrar and the seal of the institution, should be sent to the Graduate School in a sealed envelope. Transcripts that bear the statement "Issued to Student," or that do not arrive in sealed envelopes, are not considered official. International applicants must also submit a certified English translation of transcripts. The Graduate School prefers that applicants submit official transcripts with their applications. However, if an institution's registrar will only send transcripts directly to another institution, the Graduate School will accept and process transcripts separately. Do not send transcripts directly to the intended program. To prevent delays in review of an application, you should request transcripts before mid-year grades are posted. However, you are still responsible for assuring that a final transcript is received, showing award of the degree. Transcripts submitted to the Graduate School become part of the applicant's permanent record and cannot be re-released to another institution, employer, or the applicant personally.

Standardized Test (GRE, GMAT, TOEFL, etc.) Scores
Current (no more than five years old) standardized test scores, usually the GRE General Test, are required for applicants to all programs (except Studio Art, Dentistry (except Oral Biology), and Dramatic Art). Some programs also require a subject test, while others have established practices for accepting scores other than the GRE, such as MCAT, GMAT, or LSAT scores. In addition to the standardized test scores mentioned above, all international applicants, except those from countries where English is the official language of instruction or those who have received a degree from a university in the United States (excluding U.S. territories), must also submit an acceptable, official TOEFL score (minimum of 550 with a score of 50 in each section or comparable scores on the computer-based exam; some programs require a higher score and the Graduate School honors that requirement).

The Graduate School's accreditation requires that official reports (reotted directly from ETS) of all required standardized test scores be submitted as part of the application. While photocopies of score reports will be accepted for informal evaluation, an official agency report of all required scores must follow. GRE/GMAT scores are reportable for a period of five years from the date of the exam. TOEFL scores are reportable for two years from the date of the exam. The Graduate School keeps the scores for one year.

The paper versions of standardized exams are no longer widely available, if at all. Instead, the computerized versions are offered, without prior registration, four days a week at Sylvan Learning Centers throughout the country. (For information on computerized testing call 1-800-967-1101) Four to six weeks are required for test scores to be reported to institutions; the exam should be taken no later than October for fall admission consideration. If the UNC-Chapel Hill Graduate School is not specified as a score recipient at the time of the exam, the Educational Testing Service will need to send the scores to the Graduate School of the University of North Carolina at Chapel Hill (Institution Code #5816).

Supplemental (Program-Specific) Application Material
Many programs require statements of purpose, supplemental applications, essays, portfolios, etc. The intended program should be contacted regarding their requirements before an application is submitted. An application cannot be considered complete until all required material is submitted.

Special Information for International Applicants
The University of North Carolina at Chapel Hill encourages a diverse student body and welcomes applicants from all over the world. Please be aware that there may be limited financial resources available to support international students, and an on-site admissions interview may be required. Early contact with the intended program is essential before submitting an application since the application process itself is expensive.

All applicants must pay a non-refundable application fee of $60 for each program. The fee can be paid online by credit card, or by check (drawn on a U.S. bank) or money order—no cash—made payable to the University of North Carolina at Chapel Hill. This fee cannot be waived. If someone
other than the applicant is paying the fee, the applicant's name must be clearly indicated on the check or money order. Applications arriving without the required fee will remain on file, unprocessed, pending receipt of the fee. Notification that an application was received will only occur once the fee has been paid and the application has been processed.

In addition to the material required of all applicants, international applicants must also submit the following:

**Test of English as a Foreign Language (TOEFL)**

All international applicants, except those from countries where English is the official language of instruction OR those who have received a degree from a university in the United States (excluding trust territories), must also submit an acceptable official (reported directly by ETS) TOEFL score. The required minimum total score on the TOEFL test is 550, with a minimum of 50 in each section, or equivalent scores from the computer-based exam. Some programs require a higher score; the Graduate School honors that requirement. TOEFL scores are reportable for two years from the date of the exam. ETS will not report scores more than two years old, and thus we cannot consider them. We will keep TOEFL scores on file for only one year. When registering for the test, applicants should indicate the University of North Carolina at Chapel Hill Graduate School (institution #5816) as a score recipient. If it is not specified at the time of taking the TOEFL that the UNC-Chapel Hill Graduate School is to receive the scores, the applicant must ask Educational Testing Service (ETS) to send the scores to the Graduate School of the University of North Carolina at Chapel Hill (institution #5816). Their address is TOEFL, CN6151, Princeton, NJ 08541-6151. While photocopies of score reports will be accepted for informal evaluation, admission can not be offered until the official report arrives.

**Financial Certificate**

In order to meet U.S. Immigration requirements for entry into the United States and to receive visa documents, international applicants must provide proof of sufficient financial resources to cover educational and living expenses for the duration of the intended program. Along with the application for admission, a completed Financial Certificate outlining financial support available, along with original evidence to support the amounts reflected (bank statements, scholarship letters, etc.), must be submitted. This form is also required for international students currently residing in the United States. The University does not have special travel or study scholarships for international students.

**Transcripts**

Academic records must be issued in the original language and be accompanied by a certified English translation. The record must bear the signature of the registrar or other academic official, and the official seal of the issuing institution. The prospective student must hold the degree of Bachelor of Arts or Bachelor of Science, or its equivalent — based on a four-year curriculum — in a foreign institution.

Information concerning a visa, United States immigration, or the Financial Certificate, can be obtained by contacting the UNC-Chapel Hill International Center at (919) 962-5661 or by visiting their web page at www.unc.edu/depts/interctr.

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**Funding Opportunities**

UNC-Chapel Hill provides financial support for graduate students in various ways. Many students receive graduate research or teaching assistantships. Others win fellowships and traineeships from University, private, and government sources. In addition, loan funds are available through the financial aid office, and work-study assistantships are offered to students with financial need.

Awards are made by the Graduate School, the various academic departments, the Office of Scholarships and Student Aid, and from external private and public sources. To be considered for a Graduate School award, applicants should submit a complete application for admission no later than December 1. To receive financial assistance, students must continue to be enrolled, making satisfactory progress toward their degree.

**University Competitive, Merit-Based Awards**

A number of merit-based awards are available through the Graduate School. Prospective students must apply for these awards directly, but may indicate when applying that they wish to be considered for these awards. To ensure full consideration for these competitive awards, it is recommended that prospective students submit a complete application for admission by December 1. Departments, curricula, and schools nominate a limited number of their most promising applicants into a University-wide competition. The Graduate School selects the top candidates to receive offers for University fellowships and merit assistantships. Announcements of Graduate School awards are made by early March. The following fellowships and assistantships are competitively awarded from the Graduate School:

**The Royster Society of Fellows**

The Royster Society of Fellows is a highly competitive fellowship created through the generosity of private donors, most significantly Dr. Thomas and Mrs. Caroline Royster. In addition to the financial award, the Society of Fellows supports and nurtures members through the mentoring of senior faculty, interdisciplinary learning, and leadership development opportunities.

Fellows will receive a competitive stipend, tuition, fees, and student health insurance each year for five years. The first and last years are non-service awards, but fellows may perform teaching and research activities for their departments in the intervening years. In the last year, fellows receive additional travel funds to present research findings at national conferences. Fellows have the opportunity to develop mentoring relationships with senior faculty and to engage in interdisciplinary forums and discussions.

The Royster Society of Fellows includes dissertation completion awards named in honor of Carolina H. and Thomas S. Royster Jr., Thomas S. and Helen Borda Royster and Snowden and Elspeth Merck Henry, Lovick P. Corn, Henry H. Dearman, Jessie Ball duPont (Adolescent Studies), Paul C. Hardin, Lyle V. Jones, Ross Johnson, and others. These fellowships support students in the final phase of their doctoral dissertations. Fellows receive a competitive stipend for one academic year, plus tuition, fees, student health insurance, and travel funds to present their research at national conferences.

**Privately Endowed University Fellowships**

The Graduate School offers other multiple-year named fellowships. Fellows receive a competitive stipend, tuition, fees, and student health insurance each academic year for five years. The first year is non-service, but fellows may perform teaching and research activities for their departments in the intervening years. These endowed fellowships include:
The Joseph E. Pogue Fellowships,
The William R. Kenan Jr. Fellowships,
The William N. Reynolds Fellowships, and
The Mrs. Victor Humphreys Graduate Fellowship.

University Merit Assistantships
Merit assistantships are one-year awards which provide a competitive stipend for entering master’s doctoral students and students entering professional, terminal-degree master’s programs. Full tuition and student health insurance are provided. Students pay only fees. Students awarded University merit assistantships will assist with teaching or research activities, not to exceed twenty hours per week, within their department.

Minority Presence Grant Program
The state of North Carolina offers the Minority Doctoral Fellowship as one mechanism to increase the number of minorities engaged in doctoral study within the UNC system. Recipients must be African American, residents of North Carolina (for tuition purposes) and pursuing a doctoral degree. Awards provide a competitive stipend plus tuition and student health insurance. Multiple year awards may be granted.

Incentive Scholarship and Grant Program for Native Americans
The state of North Carolina offers the Native American Incentive Fellowship as one mechanism to increase the number of minorities engaged in doctoral study within the UNC system. Recipients must be 1) Native Americans who maintain cultural identification as Native Americans through membership in an Indian tribe recognized by the state of North Carolina or by the federal government or through tribal affiliation or community recognition; 2) residents of North Carolina; and 3) pursuing a doctoral degree. Awards provide a competitive stipend plus tuition and student health insurance. Multiple year awards may be granted.

The Board of Governors’ Science and Technology Fellowships
University fellowships to encourage and support students in several science and technology related disciplines are available through five departments: Biomedical Engineering, Chemistry, Computer Science, Environmental Sciences and Engineering, and Physics and Astronomy. Awards provide a competitive non-service stipend, tuition, fees, and student health insurance for one academic year.

Interdisciplinary Awards
Weiss Urban Livability Fellowships and Program
Endowed through a generous gift from Professors Emeriti Charles and Shirley Weiss, this program gives students with an interest in urban livability issues an opportunity for advanced study within an interdisciplinary, trans-departmental program at the University of North Carolina at Chapel Hill. Master’s students receive a supplemental stipend of $3,000 and a departmental base award of at least $4,500; doctoral students a stipend of $5,000 and a departmental base award of $9,000. All are designated as fellows within the Weiss Urban Livability Program. Student health insurance is provided and a scholarship to pay tuition may be provided by the department. The Weiss Urban Livability Fellows meet regularly within an interdisciplinary forum to discuss and collaborate on topics of mutual interest. Guest lecturers and senior faculty from various departments meet with and provide mentoring for the fellows throughout the year.

Latané Family Human Science Program
The Latané Interdisciplinary Social and Human Science Fellowship is a program created through the vision and generous support of distinguished Professor Dr. Bibb Latané. This program gives students with an interest in advanced study in social and human sciences an opportunity for advanced study with an interdisciplinary, trans-departmental program at the University of North Carolina at Chapel Hill. Students receive a supplemental stipend of $5,000, a departmental base award of at least $9,000 and are designated as fellows within the Latané Interdisciplinary Fellowship Program. Student health insurance is provided and a scholarship to pay tuition is provided by the department. The Latané Fellows meet regularly within an interdisciplinary forum to discuss and collaborate on topics of mutual interest. Guest lecturers and senior faculty from various departments meet with and provide mentoring for the fellows throughout the year.

Scholars for Tomorrow
Scholars for Tomorrow is a new, innovative cross-disciplinary fellowship program that offers students an educational opportunity that includes interdisciplinary education, cutting-edge research, and discovery. This fellowship program allows the Graduate School to bring together diverse students around a general theme of mutual interest and importance in society. Over time Scholars for Tomorrow will address a variety of themes. Theme areas for the academic year 2002-2003 will focus on Aesthetics in Society, Computational Sciences, International Studies, and Ethics, Health, and Public Policy. Master’s students receive a supplemental stipend of $3,000 and a departmental base award of at least $4,500; doctoral students receive a supplemental stipend of $5,000, a departmental base award of at least $9,000, and are designated as fellows within the Scholars for Tomorrow Fellowship Program. Student health insurance is also provided and a scholarship for tuition is provided by the department. The Scholars for Tomorrow Fellows meet regularly within an interdisciplinary forum to discuss and collaborate on topics of mutual interest. Guest lecturers and senior faculty from various departments meet with and provide mentoring for the fellows throughout the year.

Dissertation Support for Continuing Students
These non-service awards support doctoral students engaged in research and writing toward the completion of their dissertations. The University Dissertation Completion Award supports students in the final phase of their doctoral dissertations. Awards provide a competitive stipend, tuition, fees, and student health insurance for one academic year. The Off-Campus Dissertation Award assists students conducting research away from the Chapel Hill campus. Awards provide a competitive stipend, tuition, fees, and student health insurance for one academic semester. A limited number of fellowships are also available for doctoral dissertation research in specific countries: the Werner P. Friedrich Fellowship in the Humanities for study in Switzerland, and the Georges Lurcy Fellowship for study in France.

Departmental Awards
Teaching and Research Assistantships
The majority of assistantships available to graduate students are awarded by academic departments. Approximately two thousand graduate, research, and teaching assistantships are available through specific departments. Graduate assistantships also are available through the University’s various research institutes and centers. Selection criteria and application and notification procedures vary from department to department. Applicants should discuss with the program to which they are applying the specific funding opportunities available through that department.

Federal/State Fellowships and Traineeships
A number of state and federally funded fellowships and traineeships are
available in some departments. Students must be pursuing graduate training in specified fields of study to be eligible for these awards. Interested students should request additional information from their academic departments.

Government and Foundation Fellowships to Individual Students
For many funding opportunities, students apply directly to the national private foundation or government agency. Many of these competitive awards are portable; students may use the funds at any accredited university. Since recipients are chosen through competitions held by each individual funding agency or foundation, the criteria and process for application vary.

Information about external funding opportunities is provided by the UNC-Chapel Hill GrantSource Library, which includes information from nearly ten thousand documents available from major funding sources. The University assists students in making applications to external funding sources through workshops and individual consultation. Application materials for major funding competitions are usually available from the Graduate School Fellowship Office, located in 218 Bynum Hall, or at the GrantSource Library, 307 Bynum Hall. Web: research.unc.edu/grantsource.

Additional Current Funding Information
Additional and up-to-date information regarding funding opportunities for graduate students at the University of North Carolina at Chapel Hill may be found on the web at research.unc.edu/grad/funding.

Research Funds
The Smith Graduate Research Fund supports small grants for graduate student thesis and dissertation research expenses. A limited number of Graduate School Travel Grants are available for graduate students who present their dissertation research at professional meetings. Information and application forms for these grants are available from the Graduate School, 218 Bynum Hall, or may be found on web at research.unc.edu/grad/funding.

Financial Aid
The Office of Scholarships and Financial Aid works with graduate students who need financial aid to meet the costs of attending the University. Financial support may be available through small grants, from federal or private lender loan programs, and from the federal work-study program, in the form of either hourly paid campus jobs or teaching/research assistantships.

To be eligible for financial aid programs administered by the Office of Scholarships and Student Aid, a student must be enrolled in a degree program on at least a half-time basis; a United States citizen or permanent resident; making satisfactory progress toward completion of the academic program; and, if applicable, registered for Selective Service. The student may not be in default on a loan previously received for college expenses nor owe a refund on a scholarship, grant, or loan from a previous enrollment period.

Graduate students who wish to apply for financial aid to meet the costs of attending the University must complete the Free Application for Federal Student Aid (FAFSA). The application should be completed online at www.fafsa.ed.gov. However, a paper application may be obtained from high schools, most college financial aid offices, or in person at the Office of Scholarships and Student Aid. In completing the FAFSA, the student must list UNC-Chapel Hill, code number 002974, as one of the schools to receive the FAFSA information. The information on the FAFSA will be analyzed by an agency contracted by the federal government. The agency will send information and an analysis of the student's eligibility for financial aid funds to both the student and to the Office of Scholarships and Student Aid.

A student should not wait for admission to a graduate program before applying for aid. An applicant should submit the FAFSA by February 15. If additional documentation is needed to complete a student's application for financial assistance, the Office of Scholarships and Student Aid will notify the student. A student who completes the file promptly can expect to receive notice of an award decision early in June.

Additional information about financial aid procedures and programs can be obtained from the Office of Scholarships and Student Aid, 300 Pettigrew Hall, P.O. Box 1080, Chapel Hill, NC 27514. The office is open from 8:00 a.m.-5:00 p.m. Monday-Friday. The telephone number is (919) 962-8396; telephone hours are 9:00 a.m.-4:00 p.m. Monday-Friday. More detailed information is also available at www.ais.unc.edu/sis/ssa.
Student Affairs Information

Students are at the center of the Carolina learning community. To ensure a successful learning experience, graduate and professional students are encouraged to take advantage of a variety of programs and services offered by the University through the Division of Student Affairs, the Graduate School, and individual schools and departments. Student Affairs oversees services intended for the entire University student community, and offers programs designed primarily for undergraduate students. The Graduate School, on its own and in conjunction with various Student Affairs offices, offers programs and services intended to specifically address the needs of graduate and professional students.

The Graduate School

The Graduate School is committed to improving and facilitating the integration of graduate and professional students’ academic, professional, and personal development, as well as to assist students to make the most of their Carolina experience. To further these aims, the staff of the Graduate School includes an assistant dean for Academic and Student Affairs as well as a director of Graduate Support Services. These staff positions are responsible for creating and implementing programs and services that specifically address the needs of graduate and professional students. Some of these programs are listed below. These staff members are also available to all graduate and professional students as a source of information and referral for questions involving student services, academic procedures, policies, and grievances.

- Phone: (919) 966-2611
- Web: gradschool.unc.edu

Grievances

The procedure for grade appeals is outlined in the Graduate School Handbook. The last level of appeal is the Administrative Board of the Graduate School, and their decision is final.

Orientation

Graduate and professional programs conduct a department-based orientation for new students; information on these activities is available in departmental offices.

The Graduate School sponsors a University-wide orientation program. It begins with a letter of welcome from the dean of the Graduate School and a reference guide to campus and Chapel Hill community resources. Upon arrival, new students receive a Graduate School Orientation Binder containing the Graduate School Handbook, Academic Integrity and Ethics, A Guide to Theses and Dissertations, copies of University policies, and other helpful campus and community publications that are intended to be used throughout the students’ graduate careers.

In addition, the Graduate School maintains an orientation and relocation information website, and the office in Bynum Hall is open year round to answer questions and help students find the resources they need to make the most of their Carolina experience.

Professional Development in Graduate Education

The University of North Carolina at Chapel Hill is committed to providing students with the highest quality graduate education. While this clearly entails academic training, it also includes a commitment to providing students with resources and services to enhance their graduate experience and prepare them for their post-graduate careers.

The cornerstone of professional development at Carolina is a series of one-credit-hour courses. These courses cover topics designed to promote graduate students’ academic, professional, and personal growth. Course offerings are designed to provide students with the opportunity to develop five areas of personal competencies: communication, leadership, teaching and instruction, professional adaptability, and self-awareness. Each one-credit-hour course addresses one or more of the five competencies, is graded pass/fail, and does not count toward degree requirements. It may also be audited with the permission of the instructor.

For more information, visit the website at www.unc.edu/depts/grad/profdev/home.html.

Graduate Student Foreign Language Proficiency Assessment

The Departments of Romance Languages, Germanic Languages, and Classics offer foreign language proficiency assessments in French, German, Spanish, and Latin (Classical or Medieval) for graduate students needing to satisfy a departmental foreign language requirement. This service is offered once each semester (at the end of each of the fall and spring semesters). The Graduate School administers registration for the assessments.

Division of Student Affairs

Office of the Vice Chancellor for Student Affairs

The Office of the Vice Chancellor for Student Affairs (104 Steele Building) coordinates the division’s programs and provides guidance and leadership for its departments. The office also acts as a consulting role for faculty, administrators, and students who wish to raise issues that concern the University community, with a particular focus on student needs. Members of the Office of the Vice Chancellor also serve on various University committees to represent the division’s several constituencies.

Students are encouraged to explore the opportunities offered by the Division of Student Affairs throughout their University career, either directly through the respective departments, or through the Office of the Vice Chancellor.

- Phone: (919) 966-4045
- Web: www.unc.edu/depts/dsa/ovc

Office of the Dean of Students

The Office of the Dean of Students, located in the basement of Steele Building, provides a variety of direct student services and works closely with a wide range of student programs. The Office of the Dean of Students is the contact and information point for students regarding the University’s
policies on racial and sexual harassment and discrimination based on sexual orientation. In addition, staff members provide counseling and general advisement to students and assist students, parents, and members of the University staff in dealing with crisis situations or other problems affecting student life. Staff members of the Office of the Dean of Students also work with programs that have a specific focus, such as the Student Activity Fund Office (SAFO). In addition to providing the administrative coordination of the student judicial system, staff also work with leaders of a variety of extracurricular organizations.

Phone: (919) 966-4041.
Web: www.unc.edu/depts/dos

Campus Y

Since its founding in 1860, the Campus Y has been a starting point for the development of many programs responding to students’ concerns. The mission of the Campus Y is the pursuit of social justice through the cultivation of pluralism. In particular, the Y serves as a bridge between the University and the local community by addressing the needs of both groups. Y-sponsored committees include community outreach (such as the Big Buddy, Elderly Exchange, and Tutoring programs), social issues (such as Women’s Issues and Human Rights Week), global action (such as Hunger Action and the South African Scholarship Fund) and fund-raising programs (such as the Foothills Road Race). Students can also serve on the Y Student Executive Committee, for which elections are held in the spring. All students are welcome to visit the Campus Y office (Room 102 of the Campus Y Building) to learn about volunteer service and University, local, and global issues.

Phone: (919) 962-2333.
Web: campus-y.unc.edu

University Career Services

Services for graduate students include workshops on writing résumés and curriculum vitae, interviewing, and job-seeking; résumé referral to employers; individual career advising and career interest assessment; on-campus interviewing; job listings via the web; and a reference file for students in selected curricula. Some services are limited to students who are in a UNC-Chapel Hill degree or certificate program and who are within two semesters of graduation.

Additional resources and programs include occupational and employer information, career panels, career and professional school fairs, an automated alumni network service, various employer databases, and a UCS homepage.

Students in MBA, MAC, Law, Dentistry, and Medicine are served by career services in their departments, rather than by UCS.

University Career Services is located in 211 Hanes Hall. (Temporary location for part of the academic year 2002-2003 is Nash Hall.)

Office hours are from 8:00 a.m.-5:00 p.m. Monday through Friday.
Resource Room hours are 8:00 a.m.-8:00 p.m. Monday through Thursday.
E-mail: UCS@unc.edu. Homepage: careers.unc.edu.

Counseling and Psychological Services

Counseling and Psychological Services (CAPS) provides free, confidential psychological counseling to help students solve personal, academic, and career problems. CAPS specializes in individual evaluations, counseling, psychotherapy, and career counseling. A variety of counseling, testing, developmental and informational services are offered to all students. Counseling services for individuals or groups focus on academic success, including test anxiety and time management; career decisions, including selecting or changing a major and choosing a career; relationships, including loneliness, shyness, roommate conflicts, dating relationships, and family problems; and cultural issues, including cultural identity, gay and lesbian issues, racism, and women’s issues. Also available are dissertation and thesis support groups; training and development programs; stress management and biofeedback; and communication skills training, including assertiveness training and guidance in how to overcome speech anxiety.

CAPS is located on the third floor of the James A. Taylor Student Health Services building.

Phone: (919) 966-3658.
Web: www.unc.edu/depts/unc_caps

Disability Services

The Department of Disability Services is responsible for ensuring that programs and facilities are accessible to all members of the University community. Students with disabilities/medical conditions may receive accommodations and services that are designed to remove barriers, so that they may independently meet the demands of University life. Accommodations and services, which may include, but are not limited to, note-takers, alternative testing, accessible class materials, and interpreters, are provided on an individual-needs basis. There is no charge for any accommodation or service. Students will be asked to provide documentation of the disability/medical condition from an appropriate primary care provider.

Phone: (919) 962-8300 (Voice/TDD)
Web: disabilityservices.unc.edu

Learning Disabilities Services

Learning Disabilities Services (LDS) is the University’s designated service provider to students with documented learning disabilities (LD) and attention-deficit/hyperactivity disorders (ADHD). LDS also meets the needs of students with Acquired Brain Injury (ABI) in conjunction with the Department of Disability Services, which is the campus office that works with students with disabilities other than LD and ADHD.

Phone: (919) 962-7227
Web: www.unc.edu/depts/lds

Housing

The Department of University Housing is consistent with the academic mission of the University, endeavors to provide eligible students a supportive environment within which to live. The department maintains the physical quality and the integrity of its buildings at a level conducive to security and comfort, and does so in the belief that providing a safe and healthy living environment supports and contributes to the learning process.

The University of North Carolina follows the principle that all persons shall have equal opportunity and access to facilities in any phase of University activity without regard to handicap, sex, race, creed, color, age, sexual orientation, or national origin. Under this principle, educational, cultural, social, housing, extracurricular, and employment opportunities are available on an equal basis. However, receipt of the application by and advance payment to the Department of University Housing does not guarantee admission to the University or to a residence hall. The Department of University Housing reserves the right to refuse just cause any application for space and to return any advance payment within two weeks of receipt of the completed application. Early application is encouraged.

Phone: 1-800-UNC-5502
Email: housing@unc.edu
Web: housing.unc.edu
Graduate Student Housing

The Department of Housing recognizes that the living needs of graduate and professional students are usually different from those of undergraduates. At Carolina, graduate and professional students can enjoy the benefits of being affordably close to classes, facilities, and events, and living in a community of fellow graduate students — where the atmosphere is characterized by early quiet hours and respect for personal time and space.

Whitehead Residence Hall is Carolina’s on-campus community for graduate students. It is conveniently located in the middle region of campus — just a 10-minute walk to the center of campus. Whitehead attracts a diverse and strongly international group of students. Its quiet, yet friendly, atmosphere lends itself to graduate student interests and study.

Whitehead is located near the libraries, Kenan Stadium, and student athletic facilities. Parking is generally available for residents, and a fare-free campus “U” bus service offers several routes that connect the north, middle, and south regions of campus. Whitehead features a suite-style arrangement in which four rooms (single and double) share a bathroom. In addition, every room is equipped with basic furnishings including twin-size bed, desk and chair, dresser space, window coverings, telephone outlet, cable TV outlet, and computer network outlet. Residents share a laundry room, kitchen, TV lounge, and study room. Students may elect to eat an occasional meal or all meals at Chase or Lenoir Dining Halls.

Generally, demand for on-campus housing for graduate students exceeds the supply. On-campus housing is not guaranteed for graduate students although every effort is made to offer a space to all applicants. Returning residents have priority to re-sign up for the following academic year before spaces are offered to new graduate students. Please visit the website at housing.unc.edu for additional information.

Student Family Housing

Student Family Housing is available in Odum Village for married students and their dependents and for single parents with children who meet University requirements for full-time student status. The community is located in the southern region of campus near the UNC Hospitals and Medical and Dental Schools. Apartments feature one- and two-bedroom unfurnished units with shared laundry facilities. Utilities are included in the monthly rent, with the exception of long distance telephone charges and cable charges.

The Student Family Housing community is dynamic, diverse, and energetic. A variety of programs and activities offer ample opportunities to become involved. Interested students should apply for an apartment in Odum Village as far in advance of their projected enrollment date as possible. Contact the Student Family Housing Office at (919) 962-5401, and visit the website at housing.unc.edu for additional information.

Off-Campus Housing

Off-campus housing refers to any housing not owned and operated by the University of North Carolina at Chapel Hill. This category includes small group housing, such as fraternities and sororities, as well as apartments, houses, and rooms. Two-thirds of the University’s students live in the off-campus market. Some units are furnished and within walking distance to campus. Other off-campus housing consists of large, unfurnished apartment complexes, located throughout Chapel Hill and Carrboro. More specific information and listings of off-campus housing resources may be accessed on the Department of Housing’s Off-Campus Housing web page at housing.unc.edu/grad/index.html.

International Center

The International Center, located in the Frank Porter Graham Student Union, is the main administrative office for all international students, research scholars, and visiting professors. The center issues and helps maintain visa documentation, provides advising related to immigration matters and adjustment to life in the United States, and serves as a liaison between international students and scholars and their departments and governmental and private agencies involved in international education exchange. In addition to administrative and advising services, the center provides programming that helps international students and scholars maximize their experience at UNC-Chapel Hill. Programs include orientation, tax seminars, and various cultural programs. The center is a focal point for community service organizations, including the Host Family Program, Conversation Partners Program, Speakers’ Bureau, and International Women’s English Conversation Group. It also administers the UNC Class of ’38 Summer Study Abroad Fellowships. More information is available on the web at www.unc.edu/depts/intercit.

Student Health Service

The Student Health Service (SHS), located next to Kenan Stadium in the James A. Taylor Student Health Services Building, provides a broad range of ambulatory, primary care, and prevention services. Specialty care services are also available, including orthopedic, obstetrics and gynecology, dermatology, travel information and immunization, and allergy management. For convenience, in-house laboratory, radiology, pharmacy, and physical therapy services are also available.

Any student who has paid the student health fee for the current semester or summer session is eligible for health care at the SHS. The fee covers the cost of most services provided by SHS professionals, including physicians, physician extenders, nurses, physical therapists, and health educators. Additional charges are made for after-hours care, drugs, and miscellaneous supplies. Laboratory and X-ray studies at SHS require a co-payment by the user. There also may be additional charges for specialty services. Spouses not enrolled in the University as students become eligible to receive the same services as students by demonstrating appropriate insurance coverage and by paying the student health fee at SHS.

Hours of operation vary according to the academic calendar. Please call to verify hours of operation Monday through Friday and on the weekends. Preferred SHS office hours are 9 a.m. to 4:30 p.m., Monday through Friday, when students are seen on an appointment basis. For convenience, students are encouraged to call 966-2281 for an appointment. After hours care is available from 4:30 p.m. to 11 p.m. Monday-Friday and 8 a.m. to 5 p.m. on weekends. Physician extenders are available with medical and psychiatric back up. Services are considered a premium service with a visit charge during these times. If other ancillary services are required an additional fee will apply. Major problems may be referred to the UNC Hospital Emergency Department by the SHS staff when open or by the HealthLink nurse (966-2281) when the SHS is closed. Students should be aware that the student health fee does not cover medical care at UNC Hospitals or other facilities. Students will be responsible for charges incurred at the UNC Hospital Emergency Department anytime that they use those services.

Because the health fee does not cover hospitalization, surgery, and intensive care, it is strongly recommended that students have additional health insurance. The University has made arrangements with Blue Cross/Blue Shield/North Carolina to offer group health insurance coverage including major medical benefits to enrolled single and married students, their spous-
es, and children. For information, contact Hill, Chessen, and Woody (Insurance Brokers), P.O. Box 3666, Chapel Hill, NC 27515; telephone (919) 967-5900 or access their Web site at www.hillchesson.com.

North Carolina law mandates that all new students at the University document the completion of immunization requirements. Failure to comply results in cancellation of registration 30 days after classes begin. Vaccines are offered at the Student Health Service at reduced rates for students who need to complete their immunization requirement. For additional information on the SHS, access the Web site at studenthealth.unc.edu.

Carolina Union
The Carolina Union is an organization of students, professional staff, and part-time student staff who provide programs, services, and facilities for all members of the campus community. The Union contributes to the educational mission of the institution through the provision of cultural, social, educational, and entertainment programs sponsored by the Carolina Union Activities Board and the Carolina Union Performing Arts Series. The many cocurricular programs offered impact the intellectual environment of the campus and create opportunities for campus members to engage in debate, conversation, and interaction around the issues of the time.

Students play an important role in determining needs, setting programming and financing goals, and evaluating all aspects of the Union. Student employees also provide and maintain the many services offered in the Frank Porter Graham Student Union and other campus locations.

The Carolina Union Board of Directors reviews and approves Union finances, provides long-range planning for the Union, and selects the Union president from student volunteers each year. The Carolina Union Activities Board is a student organization that plans and carries out social, cultural, recreational, and educational programs for the entire student body. Programs range from informal stage performances and workshops on current issues to major speakers and popular and cultural concerts.

In addition to providing office and meeting space and services for student organizations, the Union also offers lounge space, food services, bowling, billiards, and games for all UNC students.

Employment opportunities are available in many of the Union's service areas, such as the information desk, ticket office, and technical services. (For more information, contact the administrative office in Room 201.)

More information about the Union is available on the web: www.unc.edu/depts/union/union.htm.

Cocurricular Student Organizations
The University requires that cocurricular student organizations be officially recognized each academic year. This recognition process is designed to ensure that student organizations affiliated with the University do not discriminate on the basis of race, religion, national origin, disability, age, veteran status, sex (as defined by law), or sexual orientation. In addition, official recognition provides student groups with the following benefits: applying for use (through reservation) of specified University facilities, property, services, or equipment pursuant to the Facilities Use Policy; use of the University's name in the organization's title, so long as University sponsorship or endorsement is not implied or stated; the privilege of applying for funding from the Student Activity Fee which is legislatively apportioned by the Student Congress; and the assistance of University staff. Applications for official University recognition must be completed annually, in order to ensure that active students are aware of University policies and to provide staff with information concerning University-recognized student organizations.

Applications are available in Room 201 of the Frank Porter Graham Student Union Building. All information in and attached to the application is considered public information upon the granting of recognition.

A full list of active student organizations (there are currently more than 450) is available on the web at www.unc.edu/depts/union/student/list.htm.

Student Government
The Graduate and Professional Student Federation (GPSF) is the official representative of graduate and professional students, and is organized on the basis of school, departmental, and curricula organizations. The GPSF provides communication between graduate and professional students, represents graduate and professional students both within and outside the University community, and provides structures capable of dealing with ongoing issues and concerns. It also allocates and administers the funds appropriated to it from student fees. Every duly enrolled graduate and professional student is a member of GPSF.

Web: www.unc.edu/student/orgs/gpsf

Graduate students, whether as a result of individual interest or because of teaching assistantships, may want to learn more about student government at Carolina. Information is available at www.unc.edu/student/orgs/studgov.

I. Executive Branch
A. Officers-President, Vice-President, Treasurer, Secretary, Executive Assistants, Elections Board Chair
B. Current committees that address various areas of student concern:
   Academic Affairs
   External Relations
   Human Relations
   Info-Tech
   Public Service
   Student Services

II. Judicial Branch
Student Court (both Undergraduate and Graduate). These bodies maintain original jurisdiction with respect to all violations of the Code of Student Conduct.

Student Attorney General's Staff. The staff investigates alleged violations of the Code of Student Conduct and brings to trial those charges sufficiently supported by evidence; the staff also advises and assists students accused of violations.

University Hearing Board. This court has original jurisdiction in cases deemed inappropriate for hearing within another court and appellate jurisdiction with respect to cases appealed from student courts.

III. Legislative Branch
The Student Congress (SC). The legislative branch of the student government is unicameral (one house), consisting of thirty-seven representatives elected by the student body, with the presidents of the Student Body and the Graduate and Professional Students Federation serving as nonvoting ex officio members. The Speaker of the SC is elected from among the representatives. Graduate and professional students and on- and off-campus undergraduates are proportionally represented in the Congress. Graduate and professional students represent districts composed of several schools grouped together, while undergraduates represent geographical areas.

The Congress handles a vast amount of legislation; one of its primary responsibilities is to appropriate student fees for recognized student organizations. It controls approximately $200,000 of student activity
fees. Congress also approves appointments, serves as a student advocate, and legislates changes to the Student Code.

The representatives are elected in the spring for one-year terms, and each member serves on one of three standing committees: Finance, Rules and Judiciary, and Student Affairs.

**Other Services**

**Campus Safety**
The University publishes a report of activities requiring intervention by campus security. It also includes campus security policy and procedures. This report may be obtained by contacting the office of the Associate University Counsel at (919) 962-3031 or via the web at main.psaafety.unc.edu/publicsafety.

**Student Dining Service**
Carolina Dining Services operates six separate dining facilities at UNC-Chapel Hill. Meal purchases can be made with the UNC One Card using a meal plan, à la carte, expense, or cash. All meal purchases made with the UNC One Card are not subject to the 6 percent North Carolina sales tax. Cash purchases are taxable. To find out more information about acquiring your UNC One Card, visit the One Card Office website at www.onecard.unc.edu.

Carolina Dining Services offers several meal plans that offer the convenience and value of purchasing meals on campus ahead of time. To find out more about the different meal plan options, visit the website at www.dining.unc.edu.

**Sonja Haynes Stone Black Cultural Center**
The Sonja Haynes Stone Black Cultural Center (SHSBCC) was founded in July, 1988 and is named for Dr. Sonja Haynes Stone, a member of the UNC-Chapel Hill family for more than seventeen years.

The SHSBCC is located in the Frank Porter Graham Student Union. It is a major resource of cultural, historical, and social programming for the UNC-Chapel Hill community. As a focal point for Black cultural expression, the center sponsors concerts, poetry readings, lectures, group discussions, and presentations in drama and dance. Its permanent programs include sauti mpya (the center’s literary journal), Communiversity (community Saturday school), and the Cross Cultural Communications Institute (CCCI).

The center’s mission is to assist in the University effort to enhance the educational experience of its students, faculty, and staff.

Web: www.unc.edu/depts/bcc.
Academic Resources

Scholarly Journals

The University has published scholarly journals since 1884, when Journal of the Elisha Mitchell Scientific Society first appeared.

The following list contains some of the publications currently produced by the University's graduate and professional programs.


Annali d'italianistica. The mission of this publication is to promote the study of Italian literature in its cultural context, to foster scholarly excellence, and to select topics of interest to a large number of Italianists.

www.ibiblio.org/annual

Carolina Papers in International Health and Development. A series of UNC-Chapel Hill graduate student working papers designed to promote scholarship in the fields of health and development and to raise awareness of such issues among international studies specialists.

www.unc.edu/depts/ucis/about/ucis/publications.htm

The Carolina Quarterly. Since 1948, The Carolina Quarterly has printed creative writing by established and emerging writers and poets along with penetrating reviews and fascinating features. www.unc.edu/depts/cqonline

Endeavors. Features outstanding research and creative work undertaken by faculty and students at the University. Distributed free, the magazine reaches 8,600 on- and off-campus readers in an effort to engage others in Carolina research. www.research.unc.edu/endeavors

North Carolina Law Review. Published by the School of Law to stimulate research and publication by faculty and students.

www.unc.edu/student/orgs/nclaw

Studies in Romance Languages and Literatures. For sixty years, this publication has supported and disseminated scholarship in the romance literatures.

www.unc.edu/~clherma


www.unc.edu/sycamore

The Technology Source. A peer-reviewed bimonthly periodical, whose purpose is to provide thoughtful, illuminating articles that will assist educators as they face the challenge of integrating information technology tools into teaching and into managing educational organizations.

horizon.unc.edu/TS

The University of North Carolina Studies in the Germanic Languages and Literatures. An internationally renowned monograph series in the field of Germanic studies.

www.unc.edu/depts/german/Series/seriespolicies.html

In addition, the University of North Carolina Press publishes the following journals:

Social Forces, one of the best known journals in sociology and related fields.

The High School Journal, for educational practitioners and theorists nationwide.

Studies in Philology, publishing articles on British literature before 1900 and articles on relations between British literature and works in the classical, Romance, and Germanic languages.

Southern Literary Journal, edited by Department of English faculty.

Southern Cultures, dedicated to the exploration of what makes the South the South.

The University of North Carolina Press

Web: uncpress.unc.edu

Electronic Publications: www.ibiblio.org/uncpress/epubs.shtml

The University of North Carolina Press is the primary publishing arm of the University in the scholarly field. In addition to its publication of the journals of research, it carries on a book publishing program of about eighty new titles a year. Although these books are the work of scholars from all parts of the world, the presence in the University of a professionally staffed book publishing organization, with facilities for the international distribution of works of scholarship, is a stimulus to research and writing by members of the University community. The press's program is an important contribution to the development of that aspect of the University's service which has to do with the advancement of learning.

Libraries

The University Libraries

The main humanities and social sciences collections of the Academic Affairs Library are housed in the Walter Royal Davis Library. Davis Library includes more than 900 open and closed carrels for assignment to graduate students, and an additional 1,950 lounge, carrel, and table seats for general use. The building also houses group study rooms, eleven lounges, a computer lab, and a number of special study areas. All students are also welcome to use the Louis Round Wilson Library, home of the University's special collections, as well as the Robert B. House Undergraduate Library and any of the specialized departmental libraries.

The University Libraries hold over five million bound volumes and nearly 4.5 million microforms, constituting one of the most important collections in the South. Additional information about the libraries, as well as access to the online catalogs and to many electronic resources, is available at www.lib.unc.edu. Reference librarians at any of the UNC-Chapel Hill libraries are available to help students locate materials, use print or online library resources, or tackle any question from the most basic to in-depth advice on research projects.

The University Libraries receive nearly 44,000 periodicals and other serials annually, including the publications of professional associations and learned societies. The Academic Affairs Library also receives the publications of such organizations as the Smithsonian and Carnegie institutions, the Rockefeller Foundation, the Hispanic Society of America, and the Russell Sage Foundation, and of many universities, including foreign universities and academies.

The government document collections comprise a rich body of resources. The Academic Affairs Library is a regional depository for United States government documents and United Nations publications, as well as selected foreign government documents. Particularly rich are its files of federal and state publications; state legislative journals, laws, collected documents, colonial and state records; and records of constitutional conventions.
The libraries provide access to a wide array of online resources including indexes and abstracts, statistical materials and government data, and full text titles. Many titles may be accessed from home by members of the University community. The Davis Library Information Commons makes available state-of-the-art workstations for library research.

Departmental libraries containing collections for study and research are assigned to Art, Biology (Botany and Zoology), Chemistry, City and Regional Planning, Geological Sciences, Institute of Government, Information and Library Science, Mathematics/Physics, and Music. The Law Library, containing more than 300,000 volumes, is located within the School of Law at Van Hecke-Wettach Hall. It contains material useful to students of history and government.

In addition to the collections available in-house, the libraries provide access to a multitude of external resources. Materials that the libraries do not own may be borrowed through interlibrary borrowing. UNC-Chapel Hill students may obtain a Triangle Research Libraries Network card allowing them to borrow materials from Duke, North Carolina State, and North Carolina Central Universities. The valuable manuscripts of the State Department of Archives and History and the collections of the State Library at Raleigh are also nearby.

Special Collections (Wilson Library)
The North Carolina Collection holds books, pamphlets, maps, newspapers, serials, broadsides, microforms, documents, recordings, and other materials relating to the state and its people, and ranging in date from the sixteenth century to the present. Two of its prominent collections are the Sir Walter Raleigh Collection, relating to the courtier and the era of Elizabethan exploration, and the Thomas Wolfe Collection of manuscripts and published items by and about the University’s well-known literary alumnus. The Photographic Archives provide a visual record of people, places, and events throughout the state in negatives, prints, and postcards, including examples of all formats beginning with daguerreotype of the 1840s. The North Carolina Collection Gallery exhibits artifacts, art, and furnishings related to the history and culture of the state and the University.

The Manuscripts Department consists of several units. The Southern Historical Collection preserves the private papers — letters, diaries, account books, broadsides, photographs, taped interviews, and video documentation — of individuals, families, and organizations of the region. The University Archives house the official unpublished records of the University created since its charter in 1789. The General and Literary Manuscripts Collection includes documents related to such notables as George Bernard Shaw, John Ruskin, George Cruikshank, Augustus Thomas, and Washington Irving. The Southern Folklife Collection houses extensive recorded music, field tapes, photographs, movie film, and other materials related to study and research in the field of folklore, with emphasis on materials about the region.

The Rare Book Collection includes books, pamphlets, broadsides, medieval and Renaissance manuscripts, and graphic images. Of particular interest are the Estienne Imprints, the Bernard J. Flotow Collection of the Cenista, the Archibald Henderson Collection of George Bernard Shaw, the William Henry Hoyt Collection of French History, the William A. Whitaker Collection of Samuel Johnson and His Circle, and an array of collections supporting the study of nineteenth-century British and American literature. The Hanes Foundation for the Study of Origin and Development of the Book supports the collections’ acquisition of certain important materials and sponsors the internationally renowned Hanes Lecture, a scholarly lecture series concerning the history of books and printing.

Health Sciences Library
The Health Sciences Library is the primary library for the University of North Carolina Schools of Dentistry, Medicine, Nursing, Pharmacy, and Public Health, and the University of North Carolina Hospitals. It also serves the health information needs of the entire University of North Carolina at Chapel Hill and health personnel throughout the state.

Collections
The library has an excellent collection to support curricular, research, and patient care information needs, consisting of more than 290,000 volumes and 10,000 serial titles, more than 3,900 of which are currently received. The Health Sciences Library offers a growing collection of computer-based multimedia courseware, videodisks, CD-ROMs, and other computer-assisted instruction. Information about the collection is accessible through the Triangle Research Libraries Network online catalog. Library users have free access to the majority of the library’s collections.

Borrowing
Faculty, students, and staff of the University of North Carolina at Chapel Hill and the University of North Carolina Hospitals, as well as area health professionals, receive borrowing privileges upon application. The library provides photocopy services, article delivery service, and an interlibrary loan service for materials not available on campus. Borrowing privileges are also available to any North Carolina resident for a small fee.

Information Services
Librarians are available to aid users in locating information, to instruct in the use of library resources, and to provide additional help. Online search services, with access to MEDLINE and about a hundred other databases, are also provided. Direct access to databases is offered through the University of North Carolina Literature Exchange (UNICLE) system free of charge. Obtaining an UNCLE password enables users to search MEDLINE, Nursing and Allied Health Literature, International Pharmaceutical Abstracts, and other databases from their workstations on and off-campus. These and other databases are also available in the library’s electronic information center.

The Health Sciences Library coordinates the Area Health Education Centers (AHEC) Library and Information Services Network. This is a statewide network that supports information services for community-based health professions education. Students, faculty off-campus, and preceptors receive a variety of help through the Information Connection Service.

Help in using the library’s services and collections is available by telephone, electronic mail (e-mail), as part of databases, and by appointment. A consultation service can be used to make an appointment with a library staff member to develop a search strategy for a thesis topic, to learn advanced UNICLE search techniques, or to receive any other in-depth help needed. In addition, education services faculty offer a variety of instructional programs, including orientation, workshops, and course lectures, designed to teach information-management skills.

Facilities
The library building, completed in 1982, has seating for more than seven hundred users. A large curriculum support center includes a public microcomputer learning center and two computerized teaching labs. An electronic information center on the first floor of the library has multiple workstations that can access UNCLE, the catalog, CD-ROM databases, and other information resources.
Information Technology Services

Web: www.unc.edu/computing

UNC-Chapel Hill's campus computing services are organized under a central office — Information Technology Services (ITS), comprising Academic Technology and Networks (ATN) and Administrative Information Services (AIS).

Most graduate students have their main contact with ITS through ATN, which manages academic computing, electronic mail (e-mail), public microcomputing labs, interactive media presentation, database access, exam scoring, networking, training classes, and video and classroom support. The Technical Assistance Center (TAC) assists students, staff, and faculty in using ATN services. Contact the TAC by e-mail at help@unc.edu, by web-page at help.unc.edu/techsupp, or by telephone at (919) 962-5261.

E-mail allows computer users to send each other text messages electronically. All enrolled students at UNC-Chapel Hill are eligible for a login ID that can be used for e-mail and other services. Each student, for example, can have a personal webpage on a machine sponsored by ATN. It is very simple to open an account at any of the fifteen public microcomputer labs on campus. Students may also telnet to the address makeid.unc.edu to obtain their login ID. It is no longer necessary to go to a central location such as the Technical Assistance Center to create a login ID.

Off-campus students may want to consider subscribing to an Internet service provider or learning about other ways to remotely access the University networks. Information can be found on the ATN website at help.unc.edu/online.

ATN supports fifteen public microcomputer labs throughout campus. Each lab has Windows and Macintosh machines as well as certain types of software for student use. Additionally, all lab machines have Internet connections, so students can check their e-mail or access the web. There are also laser printers for student use in each lab. Lab hours vary according to usage patterns and location; check the ATN home page at help.unc.edu or call (919) 942-4404 for information on lab locations and hours of operation.

ATN offers short training courses and hands-on classes on a number of software packages and other topics in both Windows (DOS) and Macintosh platforms in its training center on the fourth floor of Hanes Hall. Topics include hard disk management, UNIX, word processing, spreadsheet programs, and presentation programs. For a schedule or more information, access the ATN Computer Training Center schedule at help.unc.edu/training, or call (919) 962-1160.
Research Resources

The intellectual life of the University and the research activities of graduate students and faculty alike receive valuable encouragement and support from the various institutes and centers listed below. These institutes do not operate as instructional agencies within the University; rather, they serve to obtain financial and organizational assistance for the scholars who constitute their membership. Many of the institutes provide opportunities for graduate student training.

Research Institutes

Carolina Environmental Program
The Carolina Environmental Program (CEP) is an interdisciplinary initiative of the University of North Carolina at Chapel Hill. Its mission is to promote innovative approaches to the study of the environment and to lead the UNC-Chapel Hill community in addressing the environmental issues of the state, the nation, and the world. CEP crosses the traditional boundaries between academic and health affairs to involve faculty, students, and staff from more than two dozen participating units. It promotes degree programs in environmental studies and encourages interested students majoring in other disciplines to enrich their studies by taking environmental courses and participating in related activities. CEP brings together diverse teams of researchers to work on large-scale, multifaceted environmental problems. It also serves the public by providing technical assistance, training, and up-to-date information on environmental issues.
  www.unc.edu/depts/cep

Child Development Institute
(see Frank Porter Graham Child Development Institute)
  www.fpg.unc.edu

Early Childhood Research Institute on Service Utilization
The Early Childhood Research Institute on Service Utilization (ECRI) is conducting a longitudinal study designed to identify and understand the factors that significantly influence service availability, provision, and utilization for young children with vulnerabilities and disabilities and their families as well.
  www.fpg.unc.edu/activities/projects/research/ecri/ecriind.htm

Institute for the Arts and Humanities
The institute’s mission is to provide time and common space for faculty in the College of Arts and Sciences to work on projects that will advance their careers and benefit their students. The institute provides funds for faculty during the academic year or summer (Faculty Fellows Program) so that faculty may spend their time on scholarly or research activities.
  (919) 962-0249
  www.unc.edu/depts/iah

Institute for Economic Development
The Institute for Economic Development sponsors applied research, inservice training, and technical assistance activities on urban, regional, rural, and international economic development issues. Graduate students involved in these activities and receive financial support through research assistantships and internships.
  Mike Lugr, Director
  mlugr@email.unc.edu
  www.unc.edu/depts/oeed

Institute for Environmental Studies
(see Carolina Environmental Program)
  www.unc.edu/depts/cep

Institute for Research in Social Science
(see Odum Institute for Research in Social Science)
  www.irss.unc.edu

Institute of African American Research
The Institute of African American Research (IAAR) is the research component of the Sonja Haynes Stone Black Cultural Center. The mission of the institute is to promote the scholarly investigation of the culture and thought of African Americans, as well as Blacks in the Diaspora. The aim of the institute is to support intellectual productivity across far-reaching investigative interests and academic disciplines that is committed to research in Black studies. The institute supports projects that examine the impact of the African Diaspora on Black life and culture in the United States.
  www.unc.edu/depts/iaar

Institute of Government
The Institute of Government within the School of Government is devoted to teaching, research, and consultation in state and local government. Over the years the institute has served as the research agency for numerous study commissions of the state and local government.
  (919) 966-5381
  nclinfo.ilog.unc.edu

Institute of Latin American Studies
The Institute of Latin American Studies (ILAS) was created in 1940. The major functions of the institute are: (1) to encourage and stimulate study and research on Latin America at UNC-Chapel Hill, (2) to serve as a campus medium for interdisciplinary communication on Latin America, and (3) to promote the exchange of senior scholars and students and to encourage close collaborative relationships between the University and institutions of higher learning in Latin America and the Iberian Peninsula.
  (919) 966-1484
  www.unc.edu/depts/ilas
Institute of Marine Sciences
The institute's mission is to serve the state and nation through the conduct of high quality basic and applied marine science research.
(252) 726-6841
www.marine.unc.edu

Institute of Outdoor Drama
Established in 1863, the Institute of Outdoor Drama is a public service agency of UNC-Chapel Hill. It is the only advisory and research organization in the United States dedicated to the advancement of the outdoor drama movement, and serves as a resource for groups, government agencies, and individuals who wish to create new outdoor dramas or who are seeking information on the field.
(919) 962-1328
www.unc.edu/depts/outdoor

Institute on Aging
In August 1996, the North Carolina General Assembly approved funding for the creation of an Institute on Aging. The institute's mandate is to: (1) promote collaborative applied and basic gerontological research and the sharing of research information across the UNC-Chapel Hill campus and throughout the UNC system; (2) translate relevant theory and research-based knowledge into innovative programs of interdisciplinary gerontological education and practice involving the UNC-Chapel Hill Health Affairs professional schools, the School of Social Work, and the various schools and departments of the Division of Academic Affairs; and (3) provide state-of-the-art information to policy makers, program managers, service providers, clinicians, and the general public to ensure that research findings are reflected in policy recommendations, in professional practice, and in the health and human service system serving the needs of older adults and their families in North Carolina.
www.aging.unc.edu

Jordan Institute for Families
At the School of Social Work at The University of North Carolina, the Jordan Institute for Families brings together scholars and program pioneers from organizations and campuses across the state. Its mission is to provide leadership to strengthen families, enabling them to better solve their problems and achieve their dreams. The Jordan Institute's goals and objectives are to: (1) develop innovative solutions to the challenges facing families and communities; (2) explore and share throughout the state and nation practices and policies that strengthen families; (3) promote public policies and programs that build resilient families; and (4) encourage informed debate about diverse approaches for strengthening families and their communities.
www.unc.edu/jif

Kenan Institute of Private Enterprise
The Frank Hawkins Kenan Institute of Private Enterprise, an affiliate of the Kenan-Flagler Business School, encourages cooperation among business, academia, and government to foster private-sector development and to utilize the private sector to serve the public interest in the United States and worldwide. The Kenan Institute develops innovative public-private and private-private partnerships that build the capacity of people, business, and communities to prosper in market-based environments. These programs are anchored in research that provides the basis for replicating and extending these outreach programs nationally and internationally. The Kenan Institute was established in 1985 by a series of gifts from the William R. Kenan Jr. Charitable Trust and the William R. Kenan Jr. Fund. The institute operates from two locations — the Kenan Center at the University of North Carolina at Chapel Hill and Washington, D.C. A sister institute in Thailand, Kenan Institute Asia, has been established to provide a physical and institutional presence.
www.kenaninstitute.unc.edu

Odum Institute for Research in Social Science
The Odum Institute for Research in Social Science exists primarily to support the research, sponsored or unsponsored, of UNC's social science faculty. As resources permit, it also serves the research and information needs of graduate students, other UNC faculty, and administration by providing archives, grant services, research design, and statistical and computing services. It has long played an important role in undergraduate and, especially, graduate instruction in social science.
www.iss.unc.edu

Oak Ridge Institute for Science and Education
Since 1946, students and faculty of the University of North Carolina have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 85 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.
Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the ORISE Catalog of Education and Training Programs, which is available at www.orau.gov/orise/eduac.html, or by calling either of the contacts below.
ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research, and support programs as well as services to chief research officers.
For more information about ORAU and its programs, contact:
Robert P. Lowman, Director, Office of Research Services
ORAU Counselor for the University of North Carolina
Monnie E. Champion
ORAU Corporate Secretary (865-576-3306); or
Visit the ORAU home page (www.orau.org)
Triangle Institute for Security Studies
The object of TISS is to promote communication and cooperation among faculty, graduate students, and the public across disciplines and beyond the confines of each university in order to advance research and education concerning national and international security, broadly defined.
(919) 684-5162
www.unc.edu/depts/tiss

Water Resources Research Institute
The Water Resources Research Institute was established in 1964 to strengthen research and graduate education in water resources.
(919) 915-2815
www2.ncsu.edu/ncsu/wrri/inst

Research Centers

Bowles Center for Alcohol Studies
The mission of the Bowles Center for Alcohol Studies is to conduct, coordinate, and promote basic and clinical research on the causes, prevention, and treatment of alcoholism and alcohol abuse.
(919) 966-5678
www.med.unc.edu/alcohol

Carolina Center for Public Service
The Carolina Center for Public Service is a new center created to provide under one umbrella guidance, coordination, and support to the public service activities of UNC-Chapel Hill faculty, staff, and students. The center serves as a catalyst to connect the University's vast resources to the citizens of the state by providing citizens with a mechanism to identify and access University resources. It is an outgrowth of the work of the Public Service Roundtable, a grassroots group of deans, department heads, and faculty dedicated to developing ways to expand the University's capacity to serve.
www.unc.edu/cps

Carolina Population Center
The Carolina Population Center exists to serve the research and research training needs of faculty at The University of North Carolina at Chapel Hill who have interests in the population field. The center is rich in its diversity. Its 48 faculty fellows have their primary appointments in 17 departments in 5 schools or colleges within the University. The postdoctoral, predoctoral, and minority undergraduate training programs also reflect the diversity of the center.
(919) 966-2157
www.cpc.unc.edu

Cecil G. Sheps Center for Health Services Research
The Cecil G. Sheps Center for Health Services Research organizes interdisciplinary research on the structure and impact of the health care system. A fundamental interest of the center has been the interaction between the medical care system and vulnerable populations, such as the poor, the elderly, rural residents, minority groups, the chronically ill, children, and the mentally ill.
(919) 966-5011
www.shepscenter.unc.edu

Center for Advanced Study of the Environment
The Center for the Advanced Study of the Environment (CASE) studies the theoretical and computational modeling of spatiotemporal physical and biological systems; the investigation (through modeling and experimentation) of flow, transport, and reaction phenomena in complex subsurface systems; modern geostatistics; mathematical toxicokinetics; environmental informatics; air pollution monitoring and control; exposure analysis and health effects; risk assessment; and environmental epidemiology.
(919) 966-1767
www.sph.unc.edu/envr/case

Center for Aging Research and Educational Services
The Center for Aging Research and Educational Services is dedicated to serving social work practitioners and decision makers who work with older adults and their families.
gmnelson@email.unc.edu
sww.unc.edu/cares/cares.htm

Center for AIDS Research
The purpose of the UNC Center for AIDS Research (CFAR) is to provide infrastructure to support investigation of the HIV/AIDS epidemic using clinical research, behavioral research, research into HIV biology and pathogenesis at the molecular level, and educational outreach. The UNC CFAR is a consortium of three complementary institutions: The University of North Carolina at Chapel Hill, Research Triangle Institute, and Family Health International.
www.cfar.unc.edu

Center for Community Capitalism
The center examines ways that government, nonprofits, and the private sector can work together through innovative public-private community development partnerships to strengthen inner cities. The center works to create public policies that will make capitalism work better in distressed communities and focuses on new ways government policy can bring the energy of private enterprise to lift inner-city residents out of poverty. It views inner cities as untapped markets with considerable financial and human resources and profit potential for enterprising businesses.
www.kenanflagler.unc.edu/centers/index.html#ccc

Center for Developmental Science
The Center for Developmental Science seeks to promote the interdisciplinary study of developmental theory and longitudinal methods. The center aims to transcend the limitations of institutional and disciplinary divisions in order to facilitate scholarship and collaboration among faculty and young scientists.
(919) 962-0333
www.cds.unc.edu/index1.html

Center for Environmental Medicine and Lung Biology
The Center for Environmental Medicine and Lung Biology of the School of Medicine was established in 1979 and is broadly concerned with environmental impacts on human health and on respiratory health in particular.
(919) 962-0126
www.med.unc.edu/envlung/WEBPAGE1.html
Center for Environmentally Responsible Solvents and Processes
More than 30 billion pounds of organic and halogenated solvents are used worldwide each year as process aids, cleaning agents, and dispersants. Considerably more water is used and contaminated in related processes. In the twenty-first century, manufacturing and service industries must increasingly attempt to avoid production, use, and subsequent release into the environment of contaminated water, volatile organic solvents, chlorofluorocarbons, and other noxious pollutants. Technological breakthroughs of the last decade now indicate that liquid and supercritical carbon dioxide (CO2) could become a very commonly used solvent in overcoming these environmental problems. The newly established S&T Center for Environmentally Responsible Solvents and Processes will have as its goal to establish the scientific fundamentals necessary to enable liquid and supercritical CO2 to replace aqueous and organic solvents in a large number of key processes in the nation’s manufacturing sector. This is a multidisciplinary effort with participants from five academic centers and three national laboratories: University of North Carolina at Chapel Hill, North Carolina State University, North Carolina A&T University, University of Texas at Austin, and University of Venice (Italy) in partnership with Sandia National Laboratory, Oak Ridge National Laboratory, and Los Alamos National Laboratory.
(919) 962-5468
www.nsfne.unc.edu

Center for European Studies
The Center for European Studies assists Europeans (faculty, graduate students, undergraduates, and interested persons outside the University community) across academic disciplines at the University of North Carolina in pursuit of their research, teaching, and studies.
www.unc.edu/depts/europe

Center for Gastrointestinal Biology and Disease
The Center for Gastrointestinal Biology and Disease promotes research and teaching on all aspects of gastrointestinal biology, physiology, and epidemiology, with special emphasis on inflammatory bowel disease. Resources at the center’s disposal include investigators and core laboratories at six constituent members of North Carolina’s university system — The University of North Carolina at Chapel Hill, the School of Medicine, and North Carolina State University, where the activities are based largely at the School of Veterinary Medicine. The level of cooperation between the six different but complementary institutions makes the center unique.
(919) 966-1757
www.md.unc.edu/wrkunits/3crtgrp/gobiolog

Center for Health Statistics Research
The Center for Health Statistics Research (CHSR) opened its doors in the fall of 1999 with the mission of providing the infrastructure and relevant expertise to address important statistical design and analysis issues tied to research focusing on high-risk populations, especially that which leads to new insights in health promotion and disease prevention. This is accomplished by (1) focusing the center’s attention on methodological issues that arise in conjunction with existing substantive research efforts, and (2) conducting this statistical research parallel to and in collaboration with the efforts of researchers in various settings of the health research landscape in North Carolina.
(919) 962-3282
www.sph.unc.edu/chsr

Center for Home Visiting
The center’s mission addresses the following goals through collaborative efforts with researchers, educators, evaluators, trainers, practitioners, and policy makers: to promote interdisciplinary research and evaluation efforts, to promote interdisciplinary training and field efforts at the college and university level, to promote interdisciplinary efforts in ongoing professional activities, and to advance the knowledge base concerning practice and training.
(919) 962-0780
www.unc.edu/-uncchv

Center for Instructional Technology
The mission of the Center for Instructional Technology is to assist UNC-Chapel Hill faculty, staff, and graduate assistants in achieving their instructional, research, and other professional objectives by providing support for commonly used and emerging technologies. The CIT works closely with the Faculty Instructional Technology Advisory Committee (FITAC) and support service providers to coordinate and promote campus-wide technology-related services.
www.unc.edu/cit

Center for Mathematics and Science Education
The Center for Mathematics and Science Education (CMSE) applies the resources of UNC-Chapel Hill to improve the teaching and learning of mathematics and science in the schools of North Carolina. Through the UNC Mathematics and Science Education Network, CMSE is teaming with nine other mathematics and science education centers at various campuses of the University of North Carolina.
www.unc.edu/depts/cmse

Center for Pharmaceutical Outcomes Research
The mission of the Center for Pharmaceutical Outcomes Research is to improve patient health outcomes, primarily those associated with the use or potential use of pharmaceuticals. The center will advance the field of health outcomes through methodology development, evaluative research, and the translation of research findings to clinical practice and pharmaceutical education.
www.pharmacy.unc.edu/cepor

Center for Public Television
The University of North Carolina Center for Public Television operates a statewide network of eleven stations with a commitment to inform, enrich, and educate viewers.
UNC-TV also supports a range of educational and social service activities; college telecourses for credit to more than 10,000 adults yearly; educational support for teachers; interactive programs with viewer participation using faxes, phones, and e-mail; and programs about topics such as substance abuse, women's health, and youth violence that benefit the community at large.
www.uncvt.org

Center for Research on Chronic Illness
The Center for Research on Chronic Illness (CRCI) provides central resources and facilities to both seasoned and novice investigators actively conducting research to assist individuals and groups to establish and maintain favorable health behaviors. Individuals and groups at high risk, or vulnerable, for developing or incurring chronic health problems are the major focus of CRCI research. Vulnerable people include the poor, marginalized
communities, those at critical development stages of life (childhood, adolescence, or old age), and residents of rural or underserved areas.

(919) 966-0453
www.unc.edu/depts/crcl

Center for Slavic, Eurasian, and East European Studies
Inasmuch as the mission of the University is the generation, preservation, transmission, and dissemination of useful knowledge, the mission of the Center for Slavic, Eurasian, and East European Studies is entirely coherent with that mission, particularly honed to the subset of knowledge pertaining to the languages, cultures, and political systems of the Slavic, Eurasian, and East European peoples and countries.

(919) 962-0901
www.unc.edu/depts/slavic

Center for Stochastic Processes
The Center for Stochastic Processes, within the Department of Statistics, provides a framework for substantial research activity in the areas of stochastic processes and related probability for significant interaction among the permanent faculty, senior, and junior visitors. The weekly Stochastic Process Seminar is a forum for exchange of current research ideas, and the center's Technical Report Series contains the research produced by permanent and visiting staff prior to publication in the scientific literature. A centerpiece of the program was the incorporation of visiting faculty — with a careful balance of new research scholars and established senior workers. This has naturally resulted in extensive research production, as may be seen from the technical reports of the center and the published papers.

(919) 962-1048
www.stat.unc.edu/center.html

Center for Study of the American South
The Center for Study of the American South affirms the commitment of the University of North Carolina at Chapel Hill to the study of the South, to teaching about the region, and to a tradition of service spanning two centuries. Through myriad programs, publications, and conferences, the center seeks to sponsor a broad public dialogue that addresses the central challenges to public life in the South. What is this shared Southern history and culture that both divides and unites Southerners? What threats to the region are posed by persistent poverty, a decline in civility, and the fragmentation of communities by racism and migration? How are recent changes to the region redefining opportunity in a global economy, transforming landscapes, and radically reshaping communities? The center brings the University's vast resources to bear on these questions.

(919) 962-5665
www.unc.edu/depts/csas

Center for Teaching and Learning
The mission of the Center for Teaching and Learning is to support teaching and learning at all levels and in all contexts in which instruction occurs in the University. In pursuing this goal, the center works to enhance the intellectual climate and promote open and ongoing dialogue among all members of the University community, and serves as an advocate for academic initiatives, as these enterprises relate to teaching and learning.

(919) 966-1289
www.unc.edu/depts/ctl

Center for Thrombosis and Hemostasis
The center's mission is to conduct research that will lead to new therapies and cures for blood clotting and bleeding disorders, thus improving the health of North Carolinians and people around the world.

(919) 966-3705
www.med.unc.edu/thromb

Center for Urban and Regional Studies
The center's mission is to promote and support within UNC-Chapel Hill, high quality basic and applied research on urban, regional, and rural planning and policy issues. The center seeks to generate new knowledge of urban and regional processes and problems and ultimately to improve living conditions in our communities. This is done by involving the University's faculty and graduate students in large, multidisciplinary research projects and smaller, more narrowly focused projects. The center's mission also includes promoting the use of the research it facilitates.

(919) 962-3074
www.unc.edu/depts/curs

Center on Minority Aging
The mission of the Center on Minority Aging is to decrease racial disparities in health by focusing on research in disease prevention, health promotion, and disability prevention for minority elders.

www.unc.edu/depts/cma/ web

Clinical Center for the Study of Development and Learning
The Clinical Center for the Study of Development and Learning (CDL) is a multidisciplinary research, technical assistance, and leadership training center. The center is dedicated to improving the lives of individuals with developmental disabilities. Its work covers the broadest range of dysfunctions and handicaps, from learning disorders and attention deficits to mental retardation and multiple handicapping conditions.

(919) 966-5171
www.unc.edu/depts/cdl

Collaborative Studies Coordinating Center
The Collaborative Studies Coordinating Center (CSCC) is a division within the Department of Biostatistics of the School of Public Health at the University of North Carolina at Chapel Hill. As the coordinating center for a number of multicenter public health and medical studies, it provides statistical, data management, quality assurance, and study management services. The organization includes professional personnel from biostatistics, epidemiology, computer science/data management, medicine, pharmacy, and nutrition. The professional personnel are supported by staff with training and experience in all of these fields as well as in study management, office management, and communication.

www-bios.sph.unc.edu/csc

Comprehensive Center for Inflammatory Disorders
Established in 1999, the Comprehensive Center for Inflammatory Disorders (CCID) is one of six national Comprehensive Oral Health Research Centers of Discovery created by the National Institute of Dental and Craniofacial Research to improve the oral health of Americans. The CCID faculty conducts basic, clinical epidemiological, and community-based research on inflammatory disorders such as periodontal disease, car-
diovascular disease, and diabetes, and on at-risk pregnant women. The center also provides comprehensive specialized oral health care to patients with periodontal disease, diabetes, and cardiovascular disease, and on patients with at-risk pregnancies. Finally, the center provides educational opportunities for scientists, professionals, and the public on the links between inflammation and systemic medical conditions.

(919) 966-1455
www.dent.unc.edu/research/cocard

Cystic Fibrosis Pulmonary Research Center
The Cystic Fibrosis Pulmonary Research and Treatment Center is a large, multidisciplinary group focused on the pathogenesis and therapy of cystic fibrosis and other lung diseases.

(919) 966-1077
www.med.unc.edu/wrkunits/3ctrpgm/cystfib

Dental Research Center
The Dental Research Center provides a central base for the research carried out by the Dental School by making available well-equipped laboratories and core research support facilities. The center fosters collaborative research relationships for faculty throughout the University and offers opportunities in graduate research training for basic sciences and clinical specialty students.

www.dent.unc.edu/research/drch.htm

Frank Porter Graham Child Development Institute
The research mission of the Frank Porter Graham Child Development Institute is to create new knowledge to enhance the lives of young children and their families. Emphasis has and will be placed on the study of vulnerable populations, such as those at risk, the disabled, or the disadvantaged.

(919) 966-2622
www.fpg.unc.edu

Functional Gastrointestinal Disorders Center
The mission of the center is to advance the understanding and care of patients with functional GI disorders. Applying the bio-psycho-social principles, the center accomplishes its mission through state-of-the-art research, training, education, and treatment of these common medical conditions.

(919) 966-0144
www.med.unc.edu/medicine/lgidc/welcome.htm

Gene Therapy Center
The goal of the Gene Therapy Center is to facilitate the progression and translation of gene therapy research from the laboratory bench into Phase I clinical trials for the treatment of human disease.

(919) 962-3285
www.med.unc.edu/wrkunits/3ctrpgm/genther

General Clinical Research Center
The mission of the General Clinical Research Center (GCRC) is to provide an optimal setting for investigation of both normal and abnormal body function; to create facilities where the cause and the natural history of human illness can be defined and where disease progression, prevention, control, and cure can be studied; to encourage, develop, and maintain a national core of expert clinical investigators; to create an environment where all types of health professionals can be trained in the many aspects of clinical research; and to expedite the translation of advances in basic scientific knowledge into new or improved methods for patient care.

(919) 966-1435
verne.med.unc.edu

Highway Safety Research Center
The Highway Safety Research Center (HSRC) is dedicated to improving transportation safety, with a major emphasis on highway safety. Its fundamental mission is to conduct basic and applied research that increases knowledge and contributes to reducing death, injury, and the related societal costs. HSRC translates developed knowledge into practical interventions that can be applied at local, state, national, and international levels.

(919) 962-2202
www.hsric.unc.edu

Injury Prevention Research Center
The mission of the UNC Injury Prevention Research Center (IPRC) is to stimulate and participate in interdisciplinary research and to facilitate the translation of research into injury control policies and programs for prevention, acute care, and rehabilitation. Through research, teaching, and service activities, IPRC seeks to further understand and prevent injuries in national and international arenas, emphasizing issues of regional importance.

(919) 966-2251
www.sph.unc.edu/iprc

Kenan Center for the Utilization of Carbon Dioxide in Manufacturing
The Kenan Center for the Utilization of Carbon Dioxide in Manufacturing is dedicated to this sustainable vision of technological, scientific, and educational advances in processing systems. The elucidation of the fundamental science and engineering principles that will make these possibilities become reality, in collaboration with industrial partners, is the mission of the Kenan Center. The center is comprised of chemists, chemical engineers, and materials scientists from the University of North Carolina at Chapel Hill and North Carolina State University. More than twenty faculty and forty students and post-doctoral associates participate in Kenan Center research. National Laboratory partners at Oak Ridge, Los Alamos, and Pacific Northwest allow use of their facilities for Kenan Center investigations, and industrial members provide financial support and guidance.

www2.unc.edu/champagne

Lineberger Comprehensive Cancer Center
The UNC Lineberger Comprehensive Cancer Center of the School of Medicine of The University of North Carolina at Chapel Hill is the public cancer center for North Carolina. The UNC Lineberger center is the focal point for cancer research and cancer-related activities at UNC-Chapel Hill. It has an organized program for postdoctoral training of basic science and prevention and control cancer research. Curricular goals of the Lineberger Comprehensive Cancer Center are implemented through academic departments. Cancer center members direct or participate in a wide variety of training programs. The center's activities are interdisciplinary, and its one hundred and eighty-five members are drawn from more than twenty-five departments in the UNC School of Medicine, the School of Public Health, the Schools of Dentistry, Nursing, Pharmacy, and the College of Arts and Sciences. The center has affiliate members from neighboring institutions including Glaxo Wellcome, the National Institute of Environmental Health Sciences, and the United States Environmental Protection Agency. The UNC Lineberger center features ten research programs that are organized in three areas: basic laboratory science, clinical science, and public health science. Basic laboratory scientists study various aspects of cancer development and progression at the molecular level. Programs include Cancer Cell Biology, Immunology, Molecular Carcinogenesis, Molecular Therapeutics, and Virology. Clinical programs include Clinical Research, Breast Cancer, and Radiation Oncology.
National Center for Catastrophic Sport Injury Research
The National Center for Catastrophic Sport Injury Research collects and disseminates data on death and permanent disability sports injury data that involve brain and/or spinal cord injuries. The research is funded by a grant from the National Collegiate Athletic Association, the American Football Coaches Association, and the National Federation of State High School Associations. This research has been conducted at the University of North Carolina at Chapel Hill since 1965.
(919) 962-5171
www.unc.edu/depts/nccsi

Neurodevelopmental Disorders Research Center
The National Institute of Child Health and Development created the Neurodevelopmental Disorders Research Center in 1967. The center, one of only twelve such research centers in the country, studies mental retardation and other developmental disorders. Its primary mission is to promote research and research training in the pathogenesis and treatment of neurodevelopmental disorders.
(919) 843-8641
www.FPG.unc.edu/~NDRC

Neuroscience Center
The mission of the Neuroscience Center is to promote neuroscience research with a specific emphasis on developmental, cellular, and disease-related processes.
www.neuroscience.unc.edu

North Carolina Center for Nanoscale Materials
The North Carolina Center for Nanoscale Materials (NCCNM) was officially established in April 1998. Major funding is provided by the Office of Naval Research, UNC-Chapel Hill, and North Carolina State University (NCSU). The center currently has 150 affiliated faculty members from several academic units at UNC-Chapel Hill and NCSU, and supports eight postdoctoral fellows and 15 graduate research assistants. The research activities in the center are directed toward understanding the fundamental science of nanoscale materials and utilizing their unique properties for commercial applications.
www.physics.unc.edu/~zhou/muri

Occupational Safety and Health Education Resource Center
The Occupational Safety and Health Education Resource Center (OSHERC) is an inter-institutional, multidisciplinary organization committed to graduate education and training of occupational health professionals.
(919) 962-2101
www.sph.unc.edu/osherc

Program on Health Outcomes
The health care industry faces growing imperatives to improve quality, effectiveness, and value in the application of health services and technologies to the health problems of individuals and populations. These imperatives, with urgency in both domestic and global markets, hinge on the ability to measure and improve the outcomes of health services and to demonstrate these improvements to consumers, providers, purchasers, and policymakers. Recognizing the need for a focus on excellence and innovation in the area of health outcomes, the multidisciplinary Program on Health Outcomes has been created at The University of North Carolina at Chapel Hill to lead and coordinate health outcomes studies and educational initiatives at UNC, in partnership with other organizations and individuals in the health care industry. The program is a focused, visible, and accessible resource within UNC-Chapel Hill where government and private health organizations can obtain expertise in health outcomes for a wide range of applications. In providing these services, it capitalizes on the critical mass of skills and resources in outcomes research in the Schools of Public Health, Medicine, Pharmacy, Nursing, and Dentistry; the Cecil G. Sheps Center for Health Services Research; other academic units; the UNC Health Care System; and outside partners.
(919) 843-9477
www.sph.unc.edu/health-outcomes/index.htm

Research Support Center
The Research Support Center was established to facilitate faculty research endeavors, with particular emphasis on expanding the research base in the School of Nursing, increasing external funding for faculty research, and developing new scholars.
(919) 966-5803
www.unc.edu/depts/ssc

Sheps Center for Health Services Research
(see Cecil G. Sheps Center for Health Services Research)
www.shepscenter.unc.edu

Sonja Haynes Stone Black Cultural Center
The general purpose of the center is to serve the cultural, intellectual, psychological, and sociological needs of both the Black and the non-Black community at UNC-Chapel Hill as these needs relate to the Black experience in America.
(919) 962-9001
www.unc.edu/depts/bcc

Thurston Arthritis Research Center
Independence is an American right. Self-sufficiency is an American ambition. Freedom of movement is an American assumption. The Thurston Arthritis Research Center draws from the spirit of this national psyche to create powerful instruments to lessen the suffering and immobility of those with arthritis-related diseases and to enhance the miracles of scientific vision.
(919) 966-4191
www.med.unc.edu/WRKUNITS/3CTRPGM/MAC

Tissue Culture Facility
The mission of the Tissue Culture Facility is to provide the members and colleagues of the UNC Lineberger Comprehensive Cancer Center with the highest quality research services and products available and to support and expand the science of cancer and medical research with professionalism and dedication.
www.unc.edu/depts/cfl/info.html

University Center for International Studies
The University Center for International Studies (UCIS) was created in 1993 to integrate the University's diverse international programs and to foster new efforts to meet the growing needs for international education, research, and service.
(919) 962-3094
www.unc.edu/depts/ucis
Research Laboratories

Baity Air Engineering Laboratory
The Baity Air Engineering Laboratory is one of the premier industrial hygiene, air pollution control, and aerosol science research facilities in the country. The laboratory is part of the Department of Environmental Sciences and Engineering at The University of North Carolina at Chapel Hill. It includes a 2,000-square-foot bay for testing air pollution control devices with a 3-ton overhead crane on a 25-foot ceiling. The laboratory also contains a 200-cubic-foot wind tunnel, fans capable of moving 10,000 cfm, an aerosol physics laboratory, a chemistry laboratory, and office space. The Baity Laboratory is housed in its own building adjacent to the UNC School of Public Health.
www.sph.unc.edu/baitylab

Macromolecular Interactions Facility
The goals and mission of the UNC Macromolecular Interactions Facility are to provide instrumentation and resources for the biophysical characterization of interactions among biological macromolecules. The Macromolecular Interactions Facility strives always to provide excellent instruction in the use and care of facility instrumentation, recommendations regarding the best instrumentation for a particular biochemical application, and assistance in experimental design.
macinfac.bio.unc.edu

Research Laboratories of Archaeology
The Research Laboratories of Archaeology were established in 1939 to conduct studies in archaeology and related fields such as ethnography, physical anthropology, and ethnohistory. Today, the research laboratories' interdepartmental program pursues research in such areas as North American prehistory and history (with a focus on the Native American cultures of North Carolina), Latin American prehistory, Old World archaeology, paleo-ethnobotany, and human osteology. Rigorous field and laboratory training is provided for graduate and undergraduate students. The Research Laboratories of Archaeology also curate one of the nation’s finest collections of Southeastern archaeological materials, including more than five million artifacts, extensive photographic collections dating from the 1930s, and smaller archaeological and ethnoarchaeological collections from Latin America, Europe, and Japan.
rla.unc.edu

Thurstone Psychometric Laboratory
The mission of The L.L. Thurstone Psychometric Laboratory is to support the research of faculty and students in the development and application of quantitative methods for psychological research. The laboratory is associated with the doctoral specialties of quantitative psychology and cognitive psychology within the Department of Psychology. Laboratory members use selected areas of mathematics for the social sciences (e.g., linear and abstract algebra; probability), statistics (e.g., hypothesis testing, multidimensional scaling, exploratory data analysis), and computer science (e.g., computer graphics, computer-human interface design) in the development of quantitative methods to advance research in psychology. Traditionally, the laboratory has applied methods of quantitative psychology to many aspects of cognitive psychological research, with the greatest emphasis on higher mental processes such as intelligence and cognitive achievement, memory, language, categorization, and decision making.
www.unc.edu/depts/quantpsy/thurstone.html

Triangle Universities Nuclear Laboratory
The Triangle Universities Nuclear Laboratory (TUNL) is a cooperative research laboratory located on the Duke University campus and supported by Duke University, North Carolina State University, and The University of North Carolina at Chapel Hill. Fifty faculty and graduate students from the three universities use the facilities. TUNL is the largest university-based nuclear physics laboratory in the Southeast, and one of the largest such laboratories in the United States. The major research interests of TUNL are studies of fundamental symmetries and studies of nuclear interactions at low to medium energies in the one to twenty million-electron-volt range.
secretary@tunl.duke.edu
www.tunl.duke.edu
University Regulations and Policies

Persons enrolled in the Graduate School are members of the student body of the University of North Carolina at Chapel Hill and are held responsible for conducting themselves in conformity with the moral and legal restraints found in any law-abiding community. They are, moreover, subject to the regulations under the Code of Student Conduct, which is divided into two components—the Honor Code and the Campus Code—and reads as follows:

The Honor Code

It shall be the responsibility of every student at the University of North Carolina at Chapel Hill to obey and to support the enforcement of the Honor Code, which prohibits lying, cheating, or stealing when these actions involve academic processes or University, student, or academic personnel acting in an official capacity.

Academic work and ensuring its integrity is a joint enterprise involving faculty and students. Because many graduate students serve as teaching assistants, it is incumbent upon graduate students to familiarize themselves with both the specific student and faculty responsibilities listed below:

The Honor Code: Student Responsibilities

- To conduct all academic work within the letter and spirit of the Honor Code, which prohibits the giving or receiving of unauthorized aid in all academic processes.
- To consult with faculty and other sources to clarify the meaning of plagiarism; to learn the recognized techniques of proper attribution of sources used in the preparation of written work; and to identify allowable resource materials or aid to be used during examination or in completion of any graded work.
- To sign a pledge on all graded academic work certifying that no unauthorized assistance has been received or given in the completion of the work.
- To comply with faculty regulations designed to reduce the possibility of cheating, such as removing unauthorized materials or aids from the room and protecting one's own examination paper from view of others.
- To maintain the confidentiality of examinations by divulging no information concerning an examination, directly or indirectly, to another student yet to write that same examination.
- To report any instance in which reasonable grounds exist to believe that a student has given or received unauthorized aid in graded work. Such report should be made to the Office of the Student Attorney General or the Office of the Dean of Students.
- To cooperate with the Office of the Student Attorney General and the defense counsel in the investigation and trial of any incident of alleged violation, including the giving of testimony when called upon. Nothing herein shall be construed to contravene a student's rights enumerated in Section V.A.2.b of The Instrument of Student Judicial Governance.

- Extracted from The Instrument of Student Judicial Governance

The Honor Code: Faculty Responsibilities

- To inform students at the beginning of each course and at other appropriate times that the Honor Code, which prohibits giving or receiving unauthorized aid, is in effect. Where appropriate, a clear definition of plagiarism and a reminder of its consequences should be presented, and the extent of permissible collaboration among students in fulfilling academic requirements should be carefully explained.
- To identify clearly in advance of any examination or other graded work the books, notes, or other materials or aids that may be used; to inform students that materials or aids other than those identified cannot be used; and to require unauthorized materials or aids to be taken from the room or otherwise made inaccessible before the work is undertaken.
- To require each student to sign a pledge when appropriate that the student has neither given nor received unauthorized aid on any written work. Grades or other credit should not be awarded for unpledged work.
- To take all reasonable steps consistent with existing physical classroom conditions—such as requiring students to sit in alternate seats—to reduce the possibility of cheating on graded work.
- To exercise caution in the preparation, duplication, and security of examinations (including make-up examinations) to ensure that students cannot gain improper advance knowledge of their contents.
- To avoid, when possible, reusing instructor-prepared examinations, in whole or in part, unless they are placed on reserve in the library or otherwise made available to all students.
- To exercise proper security in the distribution and collection of examination papers; and to be present in the classroom during an examination when the instructor believes that his or her presence is warranted or when circumstances, in his or her opinion, make that presence necessary.
- To report to the Office of the Attorney General or the Office of the Dean of Students any instance in which reasonable grounds exist to believe that a student has given or received unauthorized aid in graded work. When possible, consultation with the student should precede reporting. Private action as a sanction for academic cheating, including the assignment for disciplinary reasons of a failing grade in the course, is inconsistent with faculty policy and shall not be used in lieu of or in addition to a report of the incident.
- To cooperate with the Office of the Student Attorney General and the defense counsel in the investigation and trial of any incident of alleged violation, including the giving of testimony when called upon.

Faculty Council Legislation

These responsibilities are not all-inclusive. They constitute but the minimum required of members of the faculty and of the student body. Nor are they mutually exclusive. The obligation of a faculty member or a student to uphold the values of academic integrity in this University shall not be lessened or excused by any failure of the other to comply with his or her responsibility.

It should be noted that because any act of personal academic dishonesty strikes at the core of the University's mission, faculty, students, and administration have decided that the normal sanction for academic cheating conviction is suspension, unless unusual mitigating circumstances exist.
The Campus Code

It shall be the further responsibility of every student to abide by the Campus code: namely, to conduct oneself so as not to impair significantly the welfare or the educational opportunities of others in the University community.

All nonacademic conduct that infringes upon the rights or welfare of others at the University is thus embodied in the Campus Code. Violations of the Campus Code are handled in the same manner as violations of the Honor Code.

Alcoholic Beverages Policy

(For complete alcoholic beverages policy, see appendix.)

A policy on student possession and consumption of alcoholic beverages in facilities of the University of North Carolina at Chapel Hill has been promulgated by the Vice Chancellor for Student Affairs, with the approval of the Chancellor, to inform students of the conditions under which alcoholic beverage use consistent with federal, state, and local laws and ordinances is permitted in University facilities and on University property. Copies of the policy may be obtained from the Office of the Dean of Students or the Office of the Vice Chancellor for Student Affairs; both are located in Steele building. The text of the policy can be accessed on the World Wide Web at www.unc.edu/student/policies/alcohol.html.

Drug Policy

(For complete drug policy, see appendix.)

Students, faculty members, administrators, and other employees of the University of North Carolina at Chapel Hill are responsible, as citizens, for knowing about and complying with the provisions of North Carolina law that make it a crime to possess, sell, deliver, or manufacture those drugs designated collectively as 'controlled substances' in Article 5 of Chapter 90 of the North Carolina General Statutes. Any member of the University community who violates that law is subject to all the prosecutions and punishment by the civil authorities and to disciplinary proceedings by the University. Also, recent federal legislation requires, as a condition of employment, that any faculty or staff member engaged in the performance of a federal grant or contract must abide by the University's Drug Policy and must notify his or her dean, director, or department chair of any criminal drug statute conviction for a violation occurring in the work place not later than five days after the conviction.

Disciplinary proceedings against a student, faculty member, administrator, or other employee will be initiated when the alleged conduct is deemed to affect the University's interests. Penalties will be imposed for violation of the policies of the University only in accordance with procedural safeguards applicable to disciplinary actions against students, faculty members, administrators, and other employees. The penalties that may be imposed range from written warnings with probationary status to expulsions from enrollment and discharges from employment.

Every student, faculty member, administrator, and other employee of the University is responsible for being familiar with and complying with the terms of the Policy on Illegal Drugs adopted by the Board of Trustees. Copies of the full text of that policy are available from each student's dean, director, or department chair, or from the Office of the Dean of Students or the counseling service of the Office of Human Resources.

Smoking Ban

Legislation enacted by the General Assembly of North Carolina regulates smoking in public places. The Orange County Board of Health adopted smoking control rules that prohibit smoking in (among other places) higher education, employment, and sports facilities. Accordingly, in compliance with state and local authorities, smoking is prohibited in University facilities, except residence hall rooms.

Disciplinary Records

Disciplinary files and records of cases that resulted in "not guilty" findings will be destroyed immediately after the hearing that rendered the "not guilty" verdict. Disciplinary files and records on other adjudicated cases will be maintained for ten years after all appeal rights have expired or have been exhausted, and then destroyed. Files on pending cases will be maintained indefinitely.

Release of information contained in a student's disciplinary file or other records is governed by the provisions of the 1974 Family Educational Rights and Privacy Act.

Nondiscrimination Policy

The University of North Carolina at Chapel Hill is open to people of all races, is committed to equality of educational opportunity, and does not discriminate against applicants, students, or employees based on age, race, color, sex, national origin, religion, and disability. It is the policy of the University of North Carolina at Chapel Hill that sexual orientation be treated in this same manner. Any complaints alleging failure of this institution to follow this policy should be brought to the attention of the Vice Chancellor and General Counsel.

Amorous Relationships

It is the policy of the University of North Carolina at Chapel Hill that faculty members or other instructional staff shall not initiate, pursue, or be involved in any amorous or sexual relationships with any student whom they are in a position to evaluate or supervise by virtue of their teaching, research, or administrative responsibilities.

Friendships or mentoring relationships between faculty or instructional staff and students are not proscribed by this policy. Nor is it the intent of this policy that such nonamorous relationships be discouraged or limited in any way. Copies of the full text of this policy are available from each student's dean, director, or department chair, or from the Office of the Dean of Students or the counseling service in the Office of Human Resources.

Racial Harassment

Discrimination on the basis of race is unacceptable at the University of North Carolina at Chapel Hill. Such behavior threatens to destroy the environment of tolerance and mutual respect that must prevail if the University is to fulfill its purposes.

Because there may be conflict among freedom of speech, the right of individuals to be free from injury caused by discrimination, and the University's duty to protect the educational process, the enforcement of procedures shall recognize that it may be necessary to have varying standards depending upon the place of the conduct in question. Thus a distinction may be drawn
among public forums, educational and academic centers, and housing units. Copies of the full text of this policy are available from each student’s dean, director, or department chair, or from the Office of the Dean of Students or the counseling service in the Office of Human Resources.

**Sexual Harassment**

Sexual harassment constitutes unlawful discrimination on the basis of sex. Sexual harassment violates both law and University policy, and will not be tolerated in the University community.

Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature by one in an official University position or by a fellow University employee constitute sexual harassment when:

- submission to such conduct is made either explicitly or implicitly a term or condition of an individual’s employment or academic standing, or
- submission to or rejection of such conduct by an individual is used as a basis for an employment or academic decision affecting that individual, or
- such conduct has the purpose or effect of unreasonably interfering with an individual’s work or academic performance, or creating an intimidating, hostile, or offensive environment.

Copies of the full text of this policy are available from each student’s dean, director, or department chair, or from the Office of the Dean of Students or the counseling service of the Office of Human Resources.

**Policy on Sexual Orientation Nondiscrimination**

The University has adopted an internal policy on nondiscrimination on the basis of sexual orientation. That policy provides that educational and employment decisions should be based on individuals’ abilities and qualifications and should not be based on irrelevant factors or personal characteristics that have no connection with academic abilities or job performance. Among the traditional factors that are generally “irrelevant” are age, race, color, sex, religion, national origin, and disability. It is the policy of the University of North Carolina at Chapel Hill that an individual’s sexual orientation be treated in the same manner. Such a policy ensures that only relevant factors are considered and that equitable and consistent standards of conduct and performance are applied. This policy prohibiting discrimination on the basis of sexual orientation does not apply to the University’s relationships with outside organizations, including the federal government, the military, ROTC, and private employers. Copies of the full text of that policy are available from each student’s dean, director, or department chair, or from the Office of the Dean of Students or the counseling service of the Office of Human Resources.

**Transportation and Parking**

**Parking**

University parking areas will be zoned, meter controlled, reserved, or restricted. Parking is prohibited on campus except in lots, streets, and areas indicated in the Parking Ordinance. Legal parking at all times is restricted to the spaces as they are marked for parking. Certain spaces on campus are reserved for the physically disabled, loading and unloading, bus stop zones, service vehicles, and for special use as necessary, and may not be used by visitors. Students should apply for parking permits through a pre-registration program in April of each year.

Vehicles found parked illegally may be cited by Parking Control, and subsequent violations may result in further citations, immobilizations (“booting”), or towing of the vehicle. All citations may be appealed at the Department of Transportation and Parking’s Appeals Office. Appeals Office hours are weekdays from 7:30 a.m. through 5:00 p.m.

The Parking Control Division also operates MAP (Motorist Assistance Program) offering jump starts or lock-out key retrievals to any vehicle on campus. MAP may be contacted at the Parking Control Office at (919) 962-8006 on weekdays between 7:00 a.m. and 12:00 midnight. For motorist assistance on weekends or between 12:00 midnight and 7:00 a.m., contact UNC Police at (919) 962-8100.

Visitor parking is available in one of the seven visitor/patient pay parking areas on the UNC campus: the Cardinal and Dogwood Health Affairs Parking Decks (across from UNC Hospitals), the Hanes Visitors’ Lot (Cameron Avenue), the Swain Visitors’ Lot, the Ambulatory Care Lot (Mason Farm Road), the Hill Alumni Center Lot (in the Ramseur Lot), the Neurosciences Lot (at Manning and Gravely Drives), and in the NC 54 Visitors’ Lot (diagonally across South Road from the Institute of Government). Parking rates are 75 cents/hour with a maximum of $6.00/day per visit except in the Hanes Lot, where parking is $1.00/hour with a maximum fee of $7.00/day per visit. There is a $2.00 fee for parking in the Hanes Visitor Lot after 5:00 p.m. on weekdays (vehicles displaying a valid UNC parking permit may park cost-free in the Hanes Lot after 5:00 p.m. on weekdays). Parking is also available at any of the nearly two hundred metered spaces on campus. Most meters are activated at a rate of 25 cents/half-hour.

**Alternatives to Parking**

The UNC Department of Public Safety also sponsors many programs offering viable alternatives to parking on campus, such as:

- Regional transit (to and from RDU, Raleigh, and Durham) is available aboard Tizante Transit Authority (TTA) buses. For more information, call TTA at 549-9999.
- **UNC-CAR.** University of North Carolina Campus Area Ridesharing. UNC-CAR offers “matchmaker” services to those campus-affiliated students and personnel who wish to engage in carpooling or vanpooling.
- **UNC Bicycle Registration.** The Department of Public Safety implements a cost-free bicycle registration program for bicycles stored or traveling on campus. The program is a deterrent to crime: it can aid in the identification of lost or stolen bicycles, and it also enables the department to better plan for improved bicycle parking facilities around the UNC campus in the future.
- **Buses.** All Chapel Hill Transit routes, including service to and from campus and area park and ride lots, is fare-free. The exchange of money, coupons, or display of a bus pass is not needed when boarding. Campus “U” route and “Reverse U” shuttles run continuous routes serving nearly every area on campus. Consult the Chapel Hill Transit Guide for information on specific routes.
- **UNC Point-to-Point Campus Shuttle.** The Department of Public Safety operates a cost-free campus shuttle - the P2P - at all times except on University holidays and during daylight hours on weekends. During all operational hours, the P2P serves the needs of disabled students and students needing rides to and from the Student Health Center. During after-dark hours (dusk until dawn; hours change seasonally), the P2P serves the needs of all UNC employees and students needing transportation between official campus facilities (buildings must be "open"). Service is accessed by calling the P2P dispatcher at (919) 962-PtoP (962-7867).
Callers should provide their name, location, department number (if an employee), and destination. The dispatcher will then advise callers of when a shuttle vehicle should arrive at their location.

- **UNC Point-to-Point Express.** The P2P program also offers the Point-to-Point Express Shuttle, operating on a fixed route around campus, seven days a week during academic semesters from 7:00 p.m. through 3:00 a.m. each day. The route serves stops that are marked by signs along the route on a regular schedule. Students, staff, or faculty must show a UNC ONE Card or campus ID when boarding.

For more information, visit the UNC Department of Public Safety during its regular business hours (weekdays, 7:30 a.m.-5:00 p.m.), in the Public Safety Building on Morrison Drive (just off Manning Drive) on south campus, or call (919) 962-3951.
2002 – 2003 Academic Year
Academic Calendar

(During the 2003-2004 Academic Year, visit the Registrar’s website for an updated calendar: regweb.uit.unc.edu/calendars.html)

FIRST SUMMER SESSION 2002

Course listing available over the web for courses offered during First and Second Summer Sessions.  Thursday, December 13, 2001

Students registered for the 2002 Spring Term will be ACTIVATED into the 2002 Summer and Fall Terms in preparation for registration.  Saturday, February 23, 2002

Printed Summer Directory of Classes available.

Early Registration begins according to registration schedule.  Friday, March 1

HOLIDAY, Good Friday.

Billing dates.  Friday, April 5 – Wednesday, April 10

Early Registration closes at 5 p.m.  Wednesday, April 10

Tuition and fees due for all students.  Students who register during early registration must pay or defer tuition and fees by this date or their schedule will be cancelled and all their courses dropped.)  Friday, May 3

Pre-Registered Class Rolls distributed.

Term Registration begins for all students.  Wednesday, May 15

Residence halls open at 9 a.m.

Classes begin for all students.  Late Registration begins.  $20 fee charged for Late Registration.

Last day to add a course and end of Late Registration.  No registration or course adds accepted through the web or telephone registration system after 5 p.m.  (Last day for schools/departments to add courses online.)  Tuesday, May 21

HOLIDAY, Memorial Day.

Last day to reduce course load, but not drop all courses, and have tuition adjusted.  (Note: Dropping all courses requires processing a withdrawal of enrollment from the University and follows a different prorated refund policy.)  Tuesday, May 28

Term Registration closes at 5 p.m.  (Last day for schools/departments to drop courses online.)  Tuesday, May 28

Verification Class Rolls distributed.  Thursday, May 30

Last day for undergraduate students to drop courses.  Monday, June 3

Last day to withdraw for credit on a student’s financial account.  (Prorated over three weeks.)  Monday, June 10

Verification Class Rolls due to Registrar’s Office.  Tuesday, June 11

Last day for graduate students to file a degree application with the Graduate School for degree to be awarded in August.  Friday, June 14

Last day for graduate students to drop courses.  Friday, June 14

Last day to withdraw without any tuition credit.  Thursday, June 20

First Summer Session classes end.  Friday, June 21

Official Class Rolls and Grade Reports distributed.  (Due to the University’s Registrar's Office 72 hours after the exam is given.)  Monday, June 24

First Summer Session examinations begin.

First Summer Session examinations end.  Tuesday, June 25

Residence halls close at 6 p.m.

Last day for undergraduate students to file a degree application with their dean’s office for degree to be awarded in August.  Friday, July 5

Degree award date recorded for First Summer Session degree recipients.  Monday, August 19

SECOND SUMMER SESSION 2002

Early Registration begins according to registration schedule.  Wednesday, May 22

Billing dates.  Monday, May 27

Early Registration closes at 5 p.m.  Tuesday, May 28

Tuition and fees due for all students.  (Students who register during early registration must pay or defer tuition and fees by this date or their schedule will be cancelled and all their courses dropped.)  Tuesday, June 11
Last day for graduate students to file a degree application with the Graduate School for degree to be awarded in August.

Pre-Registered Class Rolls distributed.

Term Registration begins for all students.

Residence halls open at noon.

Classes begin for all students. Late Registration begins. $20 fee charged for Late Registration.

Last day to add a course and end of Late Registration. No registration or course adds accepted through the web or telephone registration system after 5 p.m. (Last day for schools/departments to add courses online.)

Written examinations for August master's candidates may not be taken after this date.

Last day to reduce course load, but not drop all courses, and have tuition adjusted. (Note: Dropping all courses requires processing a withdrawal of enrollment from the University and follows a different prorated refund policy.)

Term Registration closes at 5 p.m. (Last day for schools/departments to drop courses online.)

HOLIDAY, July Fourth.

Verification Class Rolls distributed.

Last day for undergraduate students to file a degree application with their dean's office for degree to be awarded in August.

Last day for undergraduate students to drop courses.

Final signed copies of doctoral dissertations and master's theses for August graduation candidates must be filed in the Graduate School by 4 p.m.

Last day to withdraw for credit on student's financial account (Prorated over three weeks.)

Verification Class Rolls due to Registrar's Office.

Last day for graduate students to drop courses.

Last day to withdraw without any tuition credit.

Second Summer Session classes end.

Official Class Rolls and Grade Reports distributed. (Due to the University's Registrar's Office 72 hours after the exam is given.)

Second Summer Session examinations begin.

Second Summer Session examinations end.

Residence halls close at 6 p.m.

Friday, June 14

Tuesday, June 18

Friday, June 21

Wednesday, June 26

Thursday, June 27

Friday, June 28

Friday, June 28

Wednesday, July 3

Wednesday, July 3

Thursday, July 4

Friday, July 5

Wednesday, July 10

Friday, July 12

Wednesday, July 17

Thursday, July 18

Tuesday, July 23

Monday, July 29

Tuesday, July 30

Wednesday, July 31

Thursday, August 1

Friday, August 2

Degree award date recorded for Second Summer Session degree recipients.

Monday, August 19

FALL SEMESTER 2002

Course listing available over the web. 

Friday, February 15, 2002

Students registered for the 2002 Spring term will be ACTIVATED into the 2002 Summer and Fall terms in preparation for registration.

Saturday, February 23

Printed Directory of Classes available.

Monday, March 4

Early Registration begins according to registration schedule.

Saturday, March 23

Billing dates.

Friday, June 21 – Friday, June 28

Early Registration closes at 5 p.m.

Wednesday, June 26

Tuition and fees due for all students.

(Students who register during early registration must pay or defer tuition and fees by this date or their schedule will be cancelled and all their courses dropped.)

Monday, July 29

Pre-Registered Class Rolls distributed.

Tuesday, August 6

Fall semester opens.

Thursday, August 15

Term Registration begins for all students.

Saturday, August 17

Residence halls open for new graduates at 9 a.m.

Saturday, August 17

Orientation/academic counseling.

Sunday, August 18

Classes begin for all students. Late Registration begins. $10 fee charged for Late Registration.

Sunday, August 18

Last day to add a course and end of Late Registration. No registration or course adds accepted through the web or telephone registration system after 5 p.m. (Last day for schools/departments to add courses online.)

Monday, August 26

HOLIDAY, Labor Day.

Monday, September 2

Last day to reduce course load, but not drop all courses, and have tuition adjusted. (Note: Dropping all courses requires processing a withdrawal of enrollment from the University and follows a different prorated refund policy.)

Tuesday, September 3

Term Registration closes at 5 p.m. (Last day for schools/departments to drop courses online.)

Tuesday, September 3

Preliminary Class Rolls distributed.

Wednesday, September 4

Last day for graduate and undergraduate students to submit Pass/Fail declarations.

Monday, September 30

Verification Class Rolls distributed.

Thursday, October 3
<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Last day for graduate and undergraduate students to file degree</td>
<td>Friday, October 11</td>
</tr>
<tr>
<td>application with their dean's office for degree to be awarded in</td>
<td>Saturday, October 12</td>
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<tr>
<td>December</td>
<td>Wednesday, October 16</td>
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<tr>
<td>University Day</td>
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<tr>
<td>Residence halls close at 6 p.m.</td>
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<tr>
<td>FALL RECESS</td>
<td></td>
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<tr>
<td>Instruction ends 5 p.m.</td>
<td>Wednesday, October 16</td>
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<tr>
<td>Instruction resumes 8 a.m.</td>
<td>Monday, October 21</td>
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<tr>
<td>Residence halls open at noon</td>
<td>Sunday, October 20</td>
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<tr>
<td>Last day to withdraw for credit on student's financial account. (</td>
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<tr>
<td>Prorated over nine weeks.)</td>
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<tr>
<td>Verification Class Rolls due to Registrar's Office by 4 p.m.</td>
<td>Monday, October 21</td>
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<tr>
<td>Written examinations for December master's candidates may not be</td>
<td>Thursday, October 24</td>
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<td>taken after this date.</td>
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<tr>
<td>Last day for graduate students to drop courses.</td>
<td>Monday, November 25</td>
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<tr>
<td>Residence halls close at 6 p.m.</td>
<td>Wednesday, November 27</td>
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<tr>
<td>THANKSGIVING RECESS</td>
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<tr>
<td>Instruction ends 1 p.m.</td>
<td>Wednesday, November 27</td>
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<tr>
<td>Instruction resumes 8 a.m.</td>
<td>Monday, December 2</td>
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<tr>
<td>Residence halls open at noon</td>
<td>Sunday, December 1</td>
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<tr>
<td>Final signed copies of doctoral dissertations and master's theses</td>
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<tr>
<td>for December graduation candidates must be filed in the Graduate</td>
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<tr>
<td>School by 4 p.m.</td>
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<tr>
<td>Fall semester classes end.</td>
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<tr>
<td>Reading day</td>
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<tr>
<td>Fall semester examinations begin.</td>
<td></td>
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<tr>
<td>Official Class Rolls and Grade Reports distributed. (Due to the</td>
<td></td>
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<tr>
<td>University Registrar's Office 72 hours after the exam is given.)</td>
<td></td>
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<tr>
<td>Reading day</td>
<td></td>
</tr>
<tr>
<td>Fall semester examinations end.</td>
<td></td>
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<tr>
<td>Residence halls close for non-graduating students at 6 p.m.</td>
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<tr>
<td>Residence halls close for graduating students at 6 p.m.</td>
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<tr>
<td>Mid-Year Commencement.</td>
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<tr>
<td>Degree award date recorded for Fall degree recipients.</td>
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</tr>
</tbody>
</table>

The fall semester 2002 calendar includes 45 class periods of 50 minutes each on MWF and 30 class periods of 75 minutes each on TTH for a total of 75 days.

<table>
<thead>
<tr>
<th>Days of Instruction</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 – Mondays</td>
<td>16 – Tuesdays</td>
</tr>
<tr>
<td>16 – Wednesdays</td>
<td>14 – Thursdays</td>
</tr>
<tr>
<td>14 – Fridays</td>
<td></td>
</tr>
<tr>
<td>45 – Total</td>
<td>30 – Total</td>
</tr>
<tr>
<td>(2,220 minutes)</td>
<td>(2,250 minutes)</td>
</tr>
</tbody>
</table>

**SPRING SEMESTER 2003**

Course listing available online. Friday, September 20, 2002

Students registered for the 2002 Fall term will be ACTIVATED into the 2003 Spring term in preparation for registration. Saturday, September 21

Printed Directory of Classes available. Friday, October 4

Early Registration begins according to registration schedule. Saturday, October 12

Billing dates. Friday, October 25 – Wednesday, November 13

Early Registration closes at 5 p.m. Tuesday, November 12

Tuition and fees due for all students. (Students who register during early registration must pay or defer tuition and fees by this date or their schedule will be cancelled and all their courses dropped.) Monday, December 9

Pre-Registered Class Rolls distributed. Tuesday, December 17

Term Registration begins for all students. Thursday, January 2, 2003

Spring semester opens. Thursday, January 2

Residence halls open at 9 a.m. Sunday, January 5

Classes begin for all students. Late Registration begins. $10 fee charged for Late Registration. Tuesday, January 7

Last day to add a course and end of Late Registration or course add accepted through the web or telephone registration systems after 5 p.m. (Last day for schools/departments to add courses online.) Monday, January 13

**HOLIDAY: MARTIN LUTHER KING JR. DAY.** Monday, January 20

(Registration period closed.)

Last day to reduce course load, but not drop all courses, and have tuition adjusted. (Note: Dropping all courses requires processing a withdrawal of enrollment from the University and follows a different prorated refund policy.) Tuesday, January 21

Term Registration closes at 5 p.m. (Last day for schools/departments to drop courses online.) Tuesday, January 21

Preliminary Class Rolls distributed. Wednesday, January 22
Last day for graduate and undergraduate students to file a degree application with their dean's office for degree to be awarded in May.

Last day for undergraduate students to drop courses.

Last day for graduate and undergraduate students to submit Pass/Fail declarations.

Verification Class Rolls distributed.

SPRING RECESS
Instruction ends 5 p.m.
Instruction resumes 8 a.m.

Last day to withdraw for credit on student’s financial account. (Tuition and fees prorated over nine weeks plus $25.)

Written examinations for May master’s candidates may not be taken after this date.

Residence halls open at noon.

Verification Class Rolls due to Registrar’s Office by 4 p.m.

Last day for graduate students to drop courses.

HOLIDAY, Good Friday.

Final signed copies of doctoral dissertations and master's theses for May graduation candidates must be filed in the Graduate School by 4 p.m.

Friday, February 14
Spring semester classes end.

Monday, February 17
Spring semester examinations begin.

Wednesday, February 19
Reading day.

Friday, March 7
Official Class Rolls and Grade Reports distributed. (Due to the University’s Registrar’s Office 72 hours after the exam is given.)

Monday, March 10
Reading day.

Tuesday, March 15
Spring semester examinations end.

Sunday, March 16
Residence halls close for non-graduating students at 6 p.m.

Residence halls close for graduating students at 6 p.m.

Saturday, March 18
Spring Commencement

Sunday, March 19
Degree award date recorded for Spring degree recipients.

Thursday, March 20
The spring semester 2003 calendar includes 44 class periods of 50 minutes each on MWF and 31 class periods of 75 minutes each on TTH for a total of 75 days.

Wednesday, April 16
Days of Instruction
14 – Mondays
16 – Wednesdays
14 – Fridays

Friday, April 18

44 – Total
(2,200 minutes)

Wednesday, April 23
31 – Total
(2,325 minutes)
Degrees Offered

Anthropology – Ph.D.
Art –
  History – M.A., Ph.D.
  Studio Art – M.F.A.
Audiology – Au.D.
Biochemistry and Biophysics – M.S., Ph.D.
Biology – M.A., M.S., Ph.D.
Biomedical Engineering – M.S., Ph.D.
Biostatistics – M.S., Dr.P.H., Ph.D., M.P.H.
Business – Ph.D.
Cell and Developmental Biology – Ph.D.
Cell and Molecular Physiology – Ph.D.
Chemistry – M.A., M.S., Ph.D.
City and Regional Planning – M.R.P., Ph.D.
Classics – M.A., Ph.D.
Communication Studies – M.A., Ph.D.
Comparative Literature – M.A., Ph.D.
Computer Science – M.S., Ph.D.
Dentistry –
  Dental Hygiene – M.S.
  Endodontics – M.S.
  Operative Dentistry – M.S.
  Oral Biology – M.S., Ph.D.
  Oral and Maxillofacial Surgery – M.S.
  Oral Radiology – M.S.
  Orthodontics – M.S.
  Pediatric Dentistry – M.S.
  Periodontology – M.S.
  Prosthodontics – M.S.
Dramatic Art – M.F.A.
Ecology – M.A., M.S., Ph.D.
Economics – M.S., Ph.D.
Education –
  Master's/Doctorate in Education – M.A., Ph.D.
  Educational Psychology – M.Ed.
  Master of Arts in Teaching – M.A.T.
  School Counseling – M.Ed.
  School Psychology – M.A., M.Ed., Ph.D.
English – M.A., Ph.D.
Exercise and Sport Science – M.A
Folklore – M.A.
Genetics and Molecular Biology – Ph.D.
Geography – M.A., Ph.D.
Geological Sciences – M.A., Ph.D.
Germanic Languages – M.A., Ph.D.
History – M.A., Ph.D.
Human Movement Science – M.S., Ph.D.
Information and Library Science – M.S.I.S., M.S.I.L.S., Ph.D.
Interdisciplinary Biomedical Sciences – Ph.D.
Journalism and Mass Communication – M.A., Ph.D.
Linguistics – M.A., Ph.D.
Marine Sciences – M.S., Ph.D.
Materials Science – M.S., Ph.D.
Mathematics – M.A., M.S., Ph.D.
Microbiology and Immunology – Ph.D.
Music – M.A., Ph.D.
Neurobiology – Ph.D.
Nursing – M.S.N., Ph.D.
Occupational Science – M.S.
Operations Research – M.S., Ph.D.
Pathology – Ph.D.
Pharmacology – M.S., Ph.D.
Pharmaceutical Sciences – M.S., Ph.D.
Philosophy – M.A., Ph.D.
Physical Therapy – M.P.T.
Physics – M.S., Ph.D.
Political Science – M.A., Ph.D.
Psychology – Ph.D.
Public Administration – M.P.A.
Public Health – M.P.H.
Biostatistics – Dr.P.H., M.P.H., M.S., Ph.D.
Environmental Sciences and Engineering –
  M.P.H., M.S., M.S.Env., M.S.P.H., Ph.D.
Epidemiology – M.P.H., M.S.P.H., Ph.D.
Health Behavior and Health Education – Dr.P.H., M.P.H., Ph.D.
Health Policy and Administration –
  Residential – Dr.P.H., M.H.A., M.P.H., M.S.P.H., Ph.D.
  Executive – M.H.A., M.P.H.
Maternal and Child Health – Dr.P.H., M.P.H., M.S.P.H., Ph.D.
Nutrition – Dr.P.H., M.P.H., M.S., Ph.D.
Public Health Leadership – M.P.H.
Public Policy – Ph.D.
Recreation and Leisure Studies – M.S.R.A.
Rehabilitation Psychology and Counseling – M.S.
Religious Studies – M.A., Ph.D.
Romance Languages – M.A., Ph.D.
Russian and East European Studies – M.A.
Slavic Languages and Literatures – M.A., Ph.D.
Social Work –
  Residential – M.S.W., Ph.D.
  Off Campus – M.S.W.
Sociology – M.A., Ph.D.
Speech and Hearing Sciences – M.S., Ph.D.
Statistics – M.S., Ph.D.
Toxicology – M.S., Ph.D.
Certificate Programs

In addition to the formal degree programs offered by the Graduate School, a number of certificate programs are available to students who are enrolled in a graduate program. These certificates offer an opportunity for students to document an area of expertise in conjunction with, and in addition to, their advanced degree.

CENTER FOR SLavic, EURASian, AND EAST EUROPEAN STUDIES

Graduate Certificate Program in Russian/East European Studies
www.unc.edu/depts/slavic/certificate.html

Graduate students at UNC-Chapel Hill working toward any graduate degree (except the M.A. in Russian/East European Studies) can earn a Graduate Certificate in Russian/East European Studies, thereby documenting their specialization in the region.

Requirements for the Certificate
• A minimum of two semesters in residence at UNC-Chapel Hill.
• Competence in a language of Russia, the former Soviet Union, or Eastern Europe. Competence is defined as two years of college study or the equivalent. A Certification of Completion of the Foreign Language Requirement for the Graduate Certificate in Russian/East European Studies must be authorized by a UNC-Chapel Hill faculty member affiliated with the Center for Slavic, Eurasian, and East European Studies.
• Four graduate courses, at least two of which must be taken outside the student's home department, on Russian or East European topics.
• A thesis, dissertation, or a major research paper on a topic related to Russian/East European Studies.

Graduate students who are interested in obtaining a Graduate Certificate in Russian/East European Studies should consult with the administrative director of the Center for Slavic, Eurasian, and East European Studies to construct a plan for completion of the requirements. One month prior to graduation, candidates should submit to the director documentation demonstrating that the requirements have been met. Certificates are issued twice each year, in January and in June.

DEPARTMENT OF MATERNAL AND CHILD HEALTH

Certificate in International Maternal and Child Health
www.sph.unc.edu/mhch/intmat.html

The purpose of this certificate is to prepare domestic and foreign students to work as maternal and child health specialists in countries outside of their own and/or for international agencies. Students will gain a comprehensive understanding of global health conditions and needs and the underlying factors affecting the health and health care of women, children, and families worldwide. Although some issues remain specific to the levels and contexts of social, economic, and political development within developing countries, many of the health problems and solutions in these countries are substantively connected to those experienced by vulnerable populations in industrialized countries.

The certificate is designed to expose interested students within a 21-month program to the theory, skills, and experiences needed to assume professional responsibilities in this area. During this time, students will receive three major types of training: theory, skill development, and practice. Awareness of a sensitivity to intercultural differences in health-related issues and behaviors and encouragement of foreign language training are also integral to the study program.

The certificate is open and available to doctoral students although it has been developed with the master's program in mind.

Requirements for the Certificate
• Four graduate-level courses with international health content, at least three of which must be MHCH courses, including MHCH 222, the international core course. Non-MHCH courses are to be selected from a pre-approved course list. (See website for list.)
• An international health practicum or internship in an international agency or foreign country. The duration of this block field training will be negotiated among the advisor, student, and the host organization.
• An emphasis within the master's paper on a direct investigation of an issue in the area of international maternal and child health. (Faculty advisors will assist the student in deciding the appropriateness of the health topic. Students may want to explore the possibility of developing this paper in tandem with the practicum experience, particularly those occurring overseas.)

Informal Instruction Opportunities
Informal instruction enriches the formal course curriculum in the department. Participation in the informal international opportunities is voluntary. Furthermore, participation in either the informal opportunities or the international MCH courses is open to all MCH students, not just those concentrating in international health.

CENTER FOR TEACHING AND LEARNING

Certificate in Postsecondary Teaching
www.unc.edu/depts/slavdep/certificate.html

Issued jointly by the Department of Slavic Languages and Literatures and the Center for Teaching and Learning (CTL), the Certificate in Postsecondary Teaching enables graduate students to develop and document their teaching expertise for formal academic and future employer recognition.

In contrast to teaching assistantships, the certificate requires:
• the student's participation in either the School of Education's course in college teaching (EDCI 265) or CTL's Foundations in Teaching Workshop Series
• continuous faculty mentoring over a three-semester sequence;
• regular small group and partnership meetings to reflect on and improve teaching strategies; and
• the student's preparation of a final portfolio for review.

The award of the certificate will be registered on the student's transcript.
Because much of the need for international health program assistance is concentrated in Latin America and Africa, training in either the Spanish, Portuguese, and/or French language is encouraged. Multilingual ability is essential for successful field work.

INSTITUTE OF LATIN AMERICAN STUDIES

Graduate Certificate in Latin American Studies
www.unc.edu/depts/ilas/gradcert.html

Although the University of North Carolina at Chapel Hill does not grant an interdisciplinary postgraduate degree in Latin American Studies, graduate students seeking to document their area of expertise are encouraged to earn a Certificate in Latin American Studies in conjunction with any advanced degree in any University graduate program.

Requirements for the Certificate
• A minimum of two semesters of residence at UNC-Chapel Hill.
• Language competence in Spanish or Portuguese. For non-native speakers, a Certification of Completion of Foreign Language Requirement must be authorized by a member of the faculty of the Department of Romance Languages.
• Four graduate courses on Latin American topics.
• A thesis on a topic related to Latin America. For exceptions, see (5).
• An oral defense of the thesis. For students in professional schools or departments that do not require defense of a thesis, a letter from the student's adviser indicating that a major research project on a Latin American topic was successfully completed is sufficient to waive the requirement.

Graduate students who are interested in obtaining a Certificate in Latin American Studies should contact the director of the Institute of Latin American Studies. Documentation should include a cover letter, a copy of UNC-Chapel Hill graduate transcripts, Certification of Completion of Foreign Language Requirement (if needed), and a photocopy of signed title page of thesis or a letter from the adviser.

Certificates are issued twice each year, in January (deadline December 15) and June (deadline May 15).

For more information about the institute or the Curriculum in Latin American Studies, call (919) 966-1484 or write:
Institute of Latin American Studies
The University of North Carolina at Chapel Hill
223 E. Franklin St., CB# 3205
Chapel Hill, NC 27599-3205

PROGRAM ON HEALTH OUTCOMES

Certificate in Health Outcomes and Quality of Care
www.sph.unc.edu/health-outcomes

This certificate is available to all graduate and professional students who wish to demonstrate academic training in health outcomes and quality of care. For general purposes, “health outcomes” is defined as the end results of the provision of health services to patients and their families. Health outcomes include a broad range of phenomena, from morbidity and death, to health status and functional status, to patient satisfaction and health-related quality of life. “Quality of care” is defined as the degree to which health services for individuals and populations increased the likelihood of desired health outcomes and are consistent with current professional knowledge.

Requirements for the Certificate
• A core proseminal, currently named and numbered HPAA 265, offered in the fall semester.
• Six hours from the approved certificate course list, but these courses may not include any core courses in the aspirant's degree program.

For more information, contact:
Sue Tolleson-Rinehart, Ph.D.
Program Administrator, UNC Program on Health Outcomes
UNC Center for Education and Research on Therapeutics
C# 7400, 269 Rosenau Hall
UNC-Chapel Hill
Chapel Hill, NC 27599-7400
suetr@unc.edu
(919) 843-9477 (voice)
(919) 966-0981 (fax)

SCHOOL OF SOCIAL WORK

Nonprofit Leadership Certificate Program
sww.unc.edu/swswc97/nonprof.htm

The Nonprofit Leadership Certificate Program prepares graduate students for leadership roles in North Carolina's rapidly growing nonprofit sector. The program provides an in-depth examination of leadership issues within human services, education, the arts, and other nonprofit organizations. Emphasis is on education and skill building at the executive and policy levels: board development, board-staff relations, nonprofit law, financial management, human resource management, strategic planning, marketing and fundraising, media relations, and advocacy.

For more information, contact:
Daniel Lebold, MSW
Program Coordinator
Nonprofit Leadership Certificate Program
UNC-Chapel Hill School of Social Work
301 Pittsboro St., CB 3550
Chapel Hill, NC 27599-3550
dalebold@email.unc.edu
(919) 962-6467
UNC-DUKE COLLABORATIVE GRADUATE CERTIFICATE PROGRAM IN DEVELOPMENTAL PSYCHOLOGY

www.unc.edu/depts/devpsych/uncduke.html

The study of human development is a rich domain of scholarly activity at both UNC-Chapel Hill and Duke University. The UNC-Duke Collaborative Graduate Certificate Program in Developmental Psychology offers students at UNC-Chapel Hill and Duke greater training opportunities than either institution alone can provide (i.e., courses, research experience, mentoring) and strengthens ongoing collaborations between faculty at UNC-Chapel Hill and Duke. Students may join the program at any point in their graduate training.

Requirements for the Certificate

Students must meet at least three of the following:

• A minimum of two developmentally relevant psychology courses must be taken for credit at the student’s non-home institution.
• At least one of the student’s major committees (e.g., Advisory Committee, Comprehensive Exam Committee, Dissertation Committee) must have at least one member who is on the developmental faculty of the non-home institution.
• Each student must participate in a research activity with a developmental faculty member from the non-home university.
• Students are expected to attend at least three program-affiliated developmental events each semester at the non-home institution.

For more information, contact:

Dr. J. Steven Reznick
Director, Program in Developmental Psychology
CB# 3270
UNC Psychology Department
Chapel Hill, NC 27599-3270

UNIVERSITY CENTER FOR INTERNATIONAL STUDIES

Graduate Certificate in International Development and Social Change

www.unc.edu/depts/ucis/academics/graduate1.htm

The University of North Carolina at Chapel Hill offers a Graduate Certificate in International Development and Social Change. The certificate is available to graduate students in all departments who wish to acquire a specialization in international development issues. The certificate may be awarded to students at either the master’s or doctoral level. For students in the School of Public Health, the Certificate in International Development and Social Change is cosponsored by the Office of Global Health.

Requirements for the Certificate

• Four graduate courses at UNC-Chapel Hill, or at any university with which UNC-Chapel Hill has a formal consortial arrangement, on a topic related to international development and social change. At least two of the courses must be taken outside the student’s home department. One of the courses must be the integrative capstone seminar designed for the certificate: City and Regional Planning 270, offered every spring. Students are encouraged to take this course after they have completed the other course work for the certificate.
• A thesis, dissertation, or major seminar paper on a topic related to international development and social change.

In addition, language or technical training is strongly encouraged if it is appropriate to the student’s field. Students should consult with a member of the Faculty Steering Committee to determine the applicability of this training.

For more information, contact:

Dr. Niklaus Steiner
Associate Director
University Center for International Studies
CB# 5145
223 E. Franklin Street
Chapel Hill, NC 27599-5145
nstein@unc.edu
(919) 962-5374
Academic Program Listings of Graduate Faculty and Courses

Appointment to the Graduate Faculty
Graduate faculty members whose appointments are current as of the publication date of this Record are listed by academic rank in the department(s) in which they serve. Following the faculty members' name is a section number that students should use when registering for independent studies, reading, research, and thesis and dissertation courses with that particular professor. Areas of specialization are listed for each faculty member following the section number.

Course Numbers and Credit
Courses numbered 100 through 199 are for advanced undergraduates and graduates; courses numbered 200 through 299 are for graduates only. Courses numbered 300 through 399 are seminar and research courses and are limited to graduate students.

The unit of measurement in meeting degree requirements is the semester hour - that is, one hour of lecture or at least two hours of laboratory or field work a week per semester. The number in parentheses following the course title in the sections "Courses for Graduates and Advanced Undergraduates" and "Courses for Graduates" indicates the value of the course in semester hours.

Department of Anthropology
JUDITH FARQUHAR, Chair

Professors
Carole L. Crumley (22) Historical Ecology, State Societies, Complex Systems Theory, Global Environment Change, Ethnography, Ethnohistory, and Archaeology of Europe
Arturo Escobar (54) Anthropology of Development, Social Movements, Science and Technology, Political Ecology, Latin America
Terence M. S. Evans (5) Social Anthropology, Social Theory, Phenomenology, Ethnics, Philosophical Anthropology, Collectivist Settlements
Judith B. Farquhar (33) Medical Anthropology, Post-Structuralist Theory, Cultural Studies, Contemporary China
Kaja Flinker (32) Medical Anthropology, Gender and Health, Peasants, Latin America
Dorothy C. Holland (16) Identity and Social Movements, Anthropology of Schooling and Work, Cultural Studies, Gender, the United States and Nepal
Norris B. Johnson (25) Architecture, Art and Aesthetics, Religious Landscapes, Japan
Paul W. Leslie (37) Biological Anthropology, Human Ecology, Demography, Population Genetics, Reproduction, East Africa, Caribbean
Catherine A. Lutz (41) Gender, Critical Theory, Mass Media, Militarization, Sociology of Psychological and Academic Discourse, Pacific and the United States
James L. Peacock (11) Culture, History, and Self, Southeast Asia and the United States
Vincent P. Stepponini (2) Archaeology, Complex Societies, Southeastern United States
Bruce P. Winterhalder (27) Curriculum in Ecology, Evolutionary and Behavioral Ecology of Humans, Sub-Arctic Hunter-Gatherers, Peasant Agriculture in the Andes

Associate Professors
Robert E. Daniels (4) Social Anthropology, Culture and Personality, Africa
Marisol de la Cadena (90) Anthropology and History, Race and Racism, Ethnicity, Identity Politics, Elite and Subaltern Intellectuals, the Military, Anthropology of Violence, Diaspora Studies, Peasants, Popular Culture, Latin America
Glenn D. Hinson (36) Folklore, Ethnography of Communication, Belief Studies, Southern United States
Donald M. Nonini (34) Historical Anthropology, Critical Theory, Political Economy, Southeast Asia
C. Margaret Scarry (48) Paleoenvirononment, Archaeological Theory and Method, Eastern United States
Margaret J. Wiener (47) Social and Cultural Theory, Power and Representation, Southeast Asia (Indonesia)

Assistant Professors
Brian Billman (51) Archaeology of Chiefdoms and States, Political Economy, Settlement Pattern Analysis, Cultural Resource Management, Andes and Southwestern United States
Valerie Lambert (59) American Indians, Ethnography, Political and Legal Anthropology, Identity, Race and Racism, Elites, United States
Peter Redfield (53) Anthropology of Science and Technology, Colonial History, Anthropology and History, Space, Global Humanism and Ecology, Europe, the Caribbean
Patricia Sawin (52) Narrative, Festive, Ethnography of Speaking, Gender, Theory, Performance and Poetics, Ethnography of Speaking, Politics of Culture, Appalachia, Francophone Southwest Louisiana
Karla Steen (56) Global/Local Studies, Social Movements, Agency, Development, Gender, Applying Anthropology, Caribbean
Silvia Tomasikova (57) Archaeology, Palaeolithic Europe, Archaeological Method and Theory, History of Science, Gender and Science, Hunter-Gatherer and Forager Studies
Peter Whittle (55) Hunter-Gatherer Archaeology, Zooarchaeology, Social Relations, Spatial Analysis, Gender, Theory, Arctic

Adjunct Professors
R. P. Stephen Davis (40) Archaeology
Sue E. Estroff (31) Medical, Psychiatric Anthropology, Chronic Illness, Health Policy as a Cultural System

Adjunct Associate Professor
Debra G. Skinner (46) Culture and Human Development, Disability Studies, Cultural Production and Identity, Anthropology of Schooling, Nepal, United States

Adjunct Assistant Professors
Gary Hausman, Medical Anthropology
William S. Lachicotte Jr. (58) Social Theory of Professions and Public Life, Mental Illness, Ethnography of Psychiatry, Sociality and Identity, United States
Michael C. Lambert, Political Anthropology, Economic Anthropology, Africa
Brett Riggs, Archaeology

Research Professors
M. Jean Black, Ethnohistory, Cultural Ecology, Ethnography, North America
Stuart Marks, Cultural/General Anthropology, Ethnology, Human Ecology, Environmental Management Systems, Humans and Other Animals, Africa (South Central), Arctic, United States South

Research Associate Professors
William H. Jansen III, Applied Anthropology, Behavioral Factors in Public Health, Public Policy, Health Service Delivery Systems, Health Care Seeking Behavior, Diplomacy, Culture Change, Circumpolar Peoples, South and Southeast Asia, Middle East
Scoot J. H. Madry, Spatial Analysis, Remote Sensing, Geographic Information Systems, GPS, Modeling, Old World Prehistory
John F. Scarry (49) Method and Theory, Cultural/Resource Management, Complex Societies, European-Native American Interaction

Research Assistant Professors
Nila Chatterjee, Political and Historical Anthropology, Migration, Gender, Post-Colonial Issues, South Asia and Diaspora
Sandy Smith-Nonini, Medical Anthropology, Professional Knowledge, Health Policy, Military Violence and Health, International Development, Social Movements, Latino Immigrants to United States, Central America
Laurie C. Steponaitis (35) Archaeology, Coastal Settlement Systems, North America

Lecturers
Elizabeth Driscoll
Stephanie Pandolfi
Bram Tacker

Visiting Lecturers/Scholars
Charles S. Haines
Robert I. Levy (38) Psychological Anthropology, Cultural Anthropology, Polynesia, Nepal
Eric Postel, Environmental Anthropology, Cultural Studies, Social and Cultural Production, European, Belgium
Dee Mack Williams, Environmental Anthropology, Health and Body, Ethnicity, Chinese Society, Mongolian Society

Professors Emeriti
Donald L. Brockington, Archaeology, Latin America, Middle America
John Glick, Social Organization, Sex Roles and Identities, Fertility Behavior, Urban Cultures, Middle East
William S. Pollitzer, Anatomy, Physical Anthropology, Human Genetics
Richard A. Yarnell, Ecology, Evolution, Ethnobotany, North America

The Department of Anthropology offers advanced work leading to the Master of Arts and Doctor of Philosophy degrees. Students admitted into the graduate program are admitted for the Ph.D. degree. A master's degree may be taken as part of the program leading to the Ph.D. degree; however, a master's degree is not an essential part of the doctoral program.

Incoming graduate students are required to complete two two-semester core courses, Sociocultural Theory and Ethnography (ANTH 201, 202) and Evolution and Ecology (ANTH 203, 204). Remaining courses are selected from a list of concentration courses, field research courses, and professional preparation courses. Students are expected to take at least three courses from within their chosen area of concentration or from a set of courses designated by the program in Medical Anthropology or the program in Archaeology.

The Ph.D. degree requires specialization in a defined area of study and the completion of an acceptable dissertation treating some problem within this area. The Ph.D. program is quite flexible; any area and problem can be selected for study, provided they meet the approval of the advisor, the Ph.D. committee, and the faculty. Part of the training of a professional anthropologist should include undertaking research within a culture significantly different from the candidate's own. Such research is normally the context for gathering dissertation data in sociocultural anthropology.

Graduate students may, in accordance with the regulations of the Graduate School, take courses offered by other departments or neighboring universities. Courses in anatomy, biology, ecology, epidemiology, folklore, history, cultural studies, genetics, geography, linguistics, philosophy, psychology, or socioculture are often particularly appropriate. Departmental policy is to help the student select courses that supplement and strengthen the specialization in anthropology.

The Department of Anthropology works closely with the Odum Institute, the the Curriculum of International Studies, University Center for Internatinal Studies, the Institute of Latin American Studies, the Carolina Population Center, the University Program in Cultural Studies, and the Research Laboratories of Archaeology and has various active training and research interests in conjunction with other departments and schools of the University.

Courses for Graduates and Advanced Undergraduates

102 ARCHAEOLOGICAL GEOLOGY (Geology 102) (3). Prerequisite, permission of the instructor. Archaeological geology is the application of geological principles and techniques to the solution of archaeological problems. Geological processes and deposits pertinent to archaeological sites, geological framework of archaeology in the southeastern United States, and techniques of archaeological geology and site analysis are studied. Students make field trips to three or more sites in the Southeast and write required reports on geological aspects of the sites. Three lecture hours a week. Fall. Staff.

105 ANTHROPOLOGY OF THE SOUTH (3). Anthropological materials and insights bearing on modernization and other current trends in southern culture; research problems in the South. Fall. (Alternate years.) Peacock.

110 PRINCIPLES OF ARCHAEOLOGY (3). An examination of archaeology as a set of techniques and a subfield of anthropology, including history of archaeology, survey and excavation techniques, laboratory treatment of remains, archaeological analysis, historical and processual inference.

111 LABORATORY METHODS IN ARCHAEOLOGY (3). An examination of the lab techniques used by archaeologists to analyze artifacts and organic remains, including the analysis of stone tools, pottery, fauna, botanic remains, and human remains. Spring. Billman, Scarry, Whitridge.

111A LABORATORY METHODS IN ARCHAEOBOTANY (3). Prerequisite, any course in archaeology or permission of instructor. An examination of the laboratory techniques and interpretative frameworks used by archaeologists to analyze plant remains recovered from archaeological sites. Scarry.

111B ZOOARCHAEOLOGY (3). Prerequisite, archaeology course or permission of instructor. Introduction to laboratory methods, analytical approaches, and interpretative frameworks of the anthropological study of animal remains from archaeological sites.

112 PALEONTHROPOLOGY (3). Detailed survey of evolution of humankind beginning with the earliest known hominids through modern Homo sapiens. Consideration of fossil record and archaeological evidence. Human origins and ongoing nature of evolution. Fall or spring. Larsen.

114 HUMAN OSTEOLGY (3). Lectures and laboratory sessions are devoted to an intensive examination of the human skeleton. Emphasis is on analysis of skeletal material in the field and in the laboratory. Spring. Larsen.

115 HUMAN GENETICS AND EVOLUTION (Anatomy 115, Genetics 115) (3). Fundamental principles of genetics; population genetics; factors of evolution; race and species formation; evolution of primates and humans. The interaction of genetics and culture in human behavior, society, and evolution. Leslie.

116 BIOARCHAEOLOGY (3). Study of human remains from archaeological settings. How human remains inform our understanding of life history, both at the individual and population levels. Focus is placed on the relationship between biology, culture, and behavior. Fall, spring.

117 EVOLUTIONARY PERSPECTIVES ON HUMAN ADAPTATION AND BEHAVIOR (3). Critical, partially historical discussion of evolutionary theories, including Darwinism, neo-Darwinism, and ethology and sociobiology and their social science analogs. Relevance and limitations of these theories for anthropologists is focal. Fall. Winterhalder.

119 GLOBAL HEALTH (INTS 119) (3). This class explores some of the historical, biological, economic, medical, and social issues surrounding globalization and health consequences. Fall.

120 ANTHROPOLOGY OF DEVELOPMENT (INST 120) (3). Course introduces students to critical analysis of Third World development by examining the various ways in which "development" has been understood from the 1950s to the
121 CULTURE AND PERSONALITY (3). Broad survey of methods and problems connected with studying personality features characteristic of tribes and modern nations, child training and personality, and the relationship of culture to mental illness. Spring. Daniels.

122 ANTHROPOLOGY AND HUMAN RIGHTS (3). This course examines human rights from an anthropological perspective, addressing the historical formation of rights, their cross-cultural context, and the emergence of humanitarian organizations. Spring. Redfield.

123 MAGIC, RITUAL, AND BELIEF (Folklore 123) (3). Prerequisite, permission of instructor. An intensive, intellectual examination of key anthropological theories of "magico-religious" thought and practice. Starting with 19th-century practice, the course discusses major anthropological approaches to understanding magico-religious thought and practice, and proceeds to offer an approach of its own. Spring. Evens.

124 LAW, CULTURE, AND SOCIETY (3). Law and legal mechanisms in their cultural and social contexts. Historical and contemporary problems of law and development are analyzed. Fall. (Alternate years.) Conley.

125 EMOTIONS AND SOCIETY (3). Survey of the relationship between emotional experience and social systems, especially including gender relations. Emotions as learned, culturally variable understandings and behaviors. Lutz.

127 ABORIGINAL CULTURES OF MEXICO AND CENTRAL AMERICA (Folklore 127) (3). The development of Indian cultures of Middle America culminating in such civilizations as the Aztec and Maya; archaeological and ethnohistorical data synthesized.


129 CULTURE AND POWER IN SOUTHEAST ASIA (Asian Studies 129) (Folklore 129) (3). The formation and transformation of worldviews, identities, and expressive forms in Southeast Asia over time, including the impact of global/national interests. Sources include translations of texts. Special focus on insular Southeast Asia. Peacock, Nonini, Wiener. BA-level non-Western comparative perspective.

130 AMERICAN INDIAN SOCIETIES (Folklore 130) (3). A broad survey of contemporary American Indian societies and cultures. Film, autobiography, literature, current issues, historical and cultural contexts. Emphasis on the multiplicity of perspectives that characterize American Indian life today. Fall or spring. Staff.

131 ARCHAEOLOGY OF SOUTH AMERICA (3). The development of native South American cultures according to archaeological and early ethnographic records.

132 LATIN AMERICAN CULTURES (Folklore 132) (3). Processes in contemporary societies, including peasant life and its transformation in urban centers; ethnicity; family life; gender roles; health care; and the relationship between third world and industrialized societies. Finkler.


135 CONSCIOUSNESS AND SYMBOLS (Folklore 135) (Comparative Literature 135) (3). Symbolizing as exemplified in the arts, religions, languages, and worldviews of various cultures. Emphasis is on the relation of symbolizing to social process as analyzed by theorists such as Durkheim, Weber, and Levi-Strauss. Fall. Peacock.

136 COLLABORATIVE VISUAL ETHNOGRAPHIC PROJECTS (Art 145) (3). Prerequisites. Art 200 and one intermediate Art class. Explores conceptual and practical strategies of examining, articulating, and representing subjects. Through collaboration students experience the dynamic nexus of anthropology, ethnography, theoretical analysis, photography, international cultural issues and historical relevance.

137 GENDER AND PERFORMANCE (Folklore 137) (3). Examines the cultural constitution of gender identity by the gender-specific assignment of artistic forms and performance roles in various parts of the world. Spring. Sawin.

138 RELIGION, NATURE, AND ENVIRONMENT (Religious Studies 130) (3). Concepts of nature within religions and a variety of worldwide spiritual traditions. Emphasis on sacred space, place, and pilgrimage as a vital intersection of religion and nature. Fall. Johnson.

139 ENVIRONMENTAL ANTHROPOLOGY (3). The general nature of interrelationships between people and environment. The course examines cultural adaptability, archaeological evidence of ecological relationships, adaptation in the ethnographic present, and environmental attention. Fall. Staff.

140 GENDER AND CULTURE (Women's Studies 140) (3). Cross-cultural perspectives on the social uses of gender distinctions. Focus on women's lives outside the United States and Europe. Comparison with students' social context. Fall. Lutz.

141 THE ANTHROPOLOGY OF GENDER, HEALTH, AND ILLNESS (3). This course explores the social and cultural patterns and practices that differentially influence health and illness among women and men. Spring. Pinkler and staff.

142 RELIGION AND ANTHROPOLOGY (Folklore 142) (Religious Studies 142) (3). Religion studied anthropologically as a cultural, social, and psychological phenomenon in the works of classical and contemporary social thought. Spring. Peacock, Tyson.

143, 144 FIELD TRAINING IN ANTHROPOLOGY (3). Supervised on-site data collection and analysis. Students develop background knowledge and select research topics before leaving campus. Instructor's permission required. Staff.

145 POLITICS OF CULTURE IN CHINA (Asian Studies 145) (3). Examines struggles to define culture and the nation in twentieth-century China, comparing these processes of cultural production with the politics of culture in the United States. Spring. Faqsuhar.

146 INTRODUCTION TO FOLKLORE (Folklore 146) (3). (See Folklore 146 for description.) Spring. Staff.


148 ANTHROPOLOGY AND PUBLIC INTEREST (3). Explores ways that anthropological theory and method can be used to impact or participate in policy debates regarding contemporary social problems. Considers professional and internship options in public service fields. Fall, spring. Socum.

149 ANTHROPOLOGY AND MARXISM (3). Examination of major writings within the Marxist critical tradition, focusing on writings that have illuminated central problems within anthropology as theoretical discourse and discipline. Introduction to recent important research in Marxist anthropology. Fall, spring. Nonini.

150 ARCHAEOLOGY OF NORTH AMERICAN INDIANS (3). The history of North American Indian cultures from 10,000 B.C. to the time of European invasion, as reconstructed from archaeological evidence. Special emphasis on the eastern woodlands and the Southwest. Fall. Steponaitis.

151 FIELD SCHOOL IN ARCHAEOLOGY (6). Prerequisite, permission of instructor. Intensive training in archaeological field methods and techniques. Students participate in excavation, recovery, and interpretation of archaeological remains; transit mapping, photography, flotation recovery, and other research procedures. Summer. Steponaitis.

152 PREHISTORIC FOODWAYS (3). Archaeological investigations of prehistoric and historic foodways. Surveys the questions asked, the data and methods used to answer those questions, and the contributions of subsistence studies to archaeological knowledge. Scarry.

153 FIELD SCHOOL IN SOUTH AMERICAN ARCHAEOLOGY (6). Prerequisite, permission of instructor. Taught in Peru. Training in excavation, labo-
154 ENVIRONMENTAL CONSCIOUSNESS AND ACTION (3). Explores anthropological perspectives on environmental issues, examining especially their shaping by structures of power and privilege, discourses of the public sphere, and public actions and reactions, rooted in place and social position. Fall. Holland. Arts and Sciences Social Science Perspective.

155 ETHNOHISTORY (Folklore 155) (3). Integration of data from ethnographic and archaeological research with pertinent historical information. Familiarization with a wide range of sources of ethnographic data and practice in obtaining and evaluating information. Pertinent theoretical concepts are explored. Fall. (Alternate years.) Crumley.

156 ARCHAEOLOGY AND ETHNOGRAPHY OF SMALL-SCALE SOCIETIES (3). Archaeological and ethnographic approaches to small-scale hunter-gatherer and farming societies, including method and theory for investigating economy, ecology, social relations, ideology. Spring. Whitridge, Scarry, Winterhalder.

157 ETHNICITY IN LATIN AMERICA (3). Through a comparative historical analysis ranging from the creation of modern Latin American nation-states to contemporary diasporas, this course focuses on the relationship between ethnicity and issues of gender, class, race, and "civilization." De La Cadena.

158 ARCHAEOLOGY OF SEX AND GENDER (3). Exploration of gender relations in past and gendered archaeological practice in present, including relevance of gender to general social theory in archaeology, and development of research designs addressing gender meanings and practices, childhood, identity, sexuality. Fall. Whitridge, Scarry.

159 EUROPEAN PREHISTORY A survey of cultures on the European continent from the emergence of first humans to the rise of civilization and the Roman conquest. Fall. Tomskova.

160 HISTORICAL ECOLOGY (ENST 160) (3). Historical Ecology is the framework for integrating physical, biological, and social science data with insights from the humanities to understand the reciprocal relationship between human activity and the Earth system. Crumley.

161 FIELD SCHOOL IN CONTEMPORARY AFRICAN CULTURE (3). Prerequisite, permission of the instructor. Intensive course taught in Kenya, combining classroom study of ethnography and history with field studies in Nairobi, Central, and Rift Valley provinces. Home stays with Kenyan families. Summer. Daniels. Approved to fulfill the cultural diversity requirement and B.A.-level social science and non-Western/comparative perspectives.

164 FOUNDATIONS OF SOCIAL ANTHROPOLOGY (3). Intensive study of theory and method by anthropology through use of standard ethnographic monographs on traditional societies, with emphasis on political dimension. Special attention given to the nature and problems of structural-functionalist explanation. Spring. Events.

165 ECONOMIC ANTHROPOLOGY (3). An intensive survey of theoretical and empirical concerns of the subfield of economic anthropology: Cross-cultural analysis of tribal, peasant, and modern economic formations. Fall. Staff.


167 URBAN ANTHROPOLOGY (3). Emphasis on the social systems and modernization processes of contemporary cities in the third world. Also considered: problems and opportunities of American anthropologists studying American industrial cities. Spring. Staff.

168 STATE FORMATION (3). Prerequisite, permission of instructor. Integration of ethno-historical, ethnographic, and archaeological data on the topic of state formation. Definitions of the state are analyzed and the determining factors relative to increasing cultural complexity discussed. Fall. (Alternate years.) Crumley, Nonini.

169 HISTORY AND ANTHROPOLOGY (3). Studies links between history and anthropology, cultures in historical perspective and history in cultural perspective, and effects of relations of power and historical interconnections on the peoples of the world. De La Cadena, Wiener.

170 MEDICINE AND ANTHROPOLOGY (Folklore 171) (3). An introduction to social and cultural aspects of illness and healing in a wide range of societies. Examines alternative healing systems in the United States. Especially relevant to pre-medical students. Fall. Farquhar, Finkler.

171 SOCIOLINGUISTICS (Linguistics 170) (3). Prerequisite, Linguistics 30, 100, or permission of instructor. This topics course in sociolinguistics treats the microsociolinguistics of everyday interactions, dialect differences, language and sex, language and power, minority rights, and the politics of pornography. Fall. Staff.

173 ANTHROPOLOGY OF THE BODY AND THE SUBJECT (Folklore 173) (3). Prerequisite, Anthropology 170 or permission of the instructor. Anthropological and historical studies of cultural constructions of bodily experience and personal subjectivity are reviewed, with special emphasis on the genesis of the modern individual and cultural approaches to gender and sexuality. Spring. Farquhar.

174 CHINESE WORLD VIEWS (Religious Studies 174) (Asian Studies 174) (3). An approach to Chinese history, literature, science, and society through an exploration of a few pervasive cultural themes. Chinese sources in translation and Western anthropological and philosophical sources are used. Fall. Farquhar.

175 ETHNOGRAPHIC METHOD (3). Intensive study of practice in many of the most commonly used anthropological data-collection techniques. Spring. Staff.

176 SELF AND OTHER IN THE ETHNOGRAPHIC ENCOUNTER (3). Explores the intersubjective relationship between ethnographer and ethnographic situation, and theoretical implications for defining practice, agency, and process in social life. Course conducted through ethnographic practice and/or textual readings. Fall. Staff.

177 EUROPEAN SOCIETIES (3). The course employs a multicultural and multimedia approach to explore factors forming the European identity. As the European Economic Community, the exploration of unifying cultural themes is particularly timely. Spring. Crumley.

178 THE CHINESE DIASPORA IN THE ASIA PACIFIC (Asian Studies 178) (3). Examination of the histories, social organizations, and cultures of the Chinese Diaspora in the Asia Pacific region, focusing on contemporary issues in the cultural politics and identities of "overseas Chinese." Fall. Nonini. Approved to fulfill a B.A.-level non-Western/comparative perspective.

179 INTRODUCTION TO GENERAL LINGUISTICS (Linguistics 100) (3). (See Linguistics 100 for description.) Fall and spring.

180 LINGUISTIC PHONETICS (Linguistics 120) (3). (See Linguistics 120 for description.) Fall.

181 INTRODUCTION TO COMPARATIVE AND HISTORICAL LINGUISTICS (Linguistics 101) (3). (See Linguistics 101 for description.) Spring. Tsiapaera.

182 CONTEMPORARY CHINESE SOCIETY (Asian Studies 182) (3). No prerequisites. This course draws on recent sociological and anthropological research in the PRC and China. Aesthetics, film, and fiction are used to explore contemporary Chinese society and culture. Spring. Farquhar.

183 PHONOLOGY I (Linguistics 123) (3). (See Linguistics 123 for description.) Spring.

184 LANGUAGE AND CULTURE (Linguistics 184) (Folklore 184) (3). The relationship of language to other aspects of culture for the analysis and description of cognitive and affective features of the semantic components of languages. Spring. Holland.
185 ANTHROPOLOGY OF SCIENCE (3). Cultural perspectives on science and technology in Western society, including research settings and social applications of science; relations between scientific worldview and power in social institutions and the popular imagination. Staff.

186 SCHOOLING AND DIVERSITY: ANTHROPOLOGICAL PERSPECTIVES (3). Anthropological approaches to issues of schooling and cultural diversity including their relationship to gender, race, and class. Critical review of theory and method in the study of the (re)production of these divisions. Spring. Holland.

188 OBSERVATION AND INTERPRETATION OF RELIGIOUS ACTION (Folklore 188) (Religious Studies 288) (3). Prerequisite, permission of instructor. Exercises (including field work) in learning to read the primary modes of public action in religious traditions: sermons, testimonies, rituals, and prayers. Primary focus on construction and interpretation of text from field observation. Spring. Peacock.

189 LANGUAGE MINORITY STUDENTS: ISSUES FOR PRACTITIONERS (Education 150). (See Education 150 for description.) Staff.

190 SYNTAX I (Linguistics 130) (3). (See Linguistics 130 for description.) Fall. Staff.

192 LINGUISTIC HYBRIDIZATION (3). Investigation of pidginization, creolization, settlers' dialects, and interlanguage. Case studies from Afrikaans, Virgin Islands Dutch Creole, Pidgin German, Yiddish, Foreign Workers' German, Tok Pisin. Fall. Roberge.

193 SYNTAX II (Linguistics 133) (3). (See Linguistics 133 for description.) Spring. Staff.

195 INTERPRETATION OF DWELLINGS (3). Theories of and methods for the study of building and landscape architecture. Field studies of residential and religious architecture and landscape. Fall. Johnson.

196 THE GARDENS, SHRINES, AND TEMPLES OF JAPAN (Art 192) (Asian Studies 196) (3). The religious landscape and built environments of Japan. Attention to palace, courtyard, and teahouse architecture, and gardens, with emphasis on Shinto shrines and the Zen Buddhist temple and garden. Spring. Johnson. (BA Aesthetic Perspective)

197 ETHNOGRAPHY AND CULTURE AFTER EMPIRE (3). Recent critiques of and new approaches to ethno-critical anthropology, with special attention to colonialism and power; fieldwork and ethnography; making and remaking the material world and subjectivities through discourses and practices. Fall, spring. Wiesner, De La Cadena.

199 SPECIAL TOPICS (Var.). Examines selected topics from an anthropological perspective. Course description for a particular semester is available in the departmental office. Fall and spring. Staff.

Courses for Graduates

201 SOCI CULTURAL THEORY AND ETHNOGRAPHY (3). Prerequisite, permission of instructor. Development of a critical understanding of the anthropological study of society and culture through discussion of problems and issues expressed in classic theoretical and ethnographic literature. Fall. Staff.

202 SOCI CULTURAL THEORY AND ETHNOGRAPHY (3). Prerequisite, Anthropology 201 or permission of instructor. Spring. Staff.

203 EVOLUTION AND ECOLOGY (3). Prerequisite, permission of instructor. Development of a critical understanding of anthropological approaches to evolution and ecology in paleontological, archaeological, and present-day cross-cultural contexts through the historical and comparative study of theory, method, and content. Fall. Staff.

204 EVOLUTION AND ECOLOGY (3). Prerequisite, Anthropology 203 or permission of instructor. Spring. Staff.

205 SEMINAR IN ARCHAEOLOGICAL THEORY (3). The seminar reviews the recent history of archaeology and samples contemporary approaches to archaeological interpretation. Crumley.

210 WRITING AND PUBLISHING IN ANTHROPOLOGY (3). A seminar on the peer review and analysis of student writing. Training in writing for academic publication. Spring. (Alternate years.) Staff.

215 FEMINISM AND SOCIETY (3). Selected topics in feminist analysis of social life, with materials drawn from a global range of societies. Spring. Lutz.

217 ADVANCED STUDIES IN ART AND ARCHITECTURE (3). Prerequisites, Anthropology 134 (Art 174/Folklore 134) or permission of the instructor. Intensive study of selected topics and issues in the analysis and interpretation of prehistoric and cross-cultural art, architecture, and other aesthetic forms. Fall. Johnson.

222 RESEARCH METHODS IN ARCHAEOLOGY (3). A study of the basic principles underlying archaeological study of prehistoric sites. Field trips and laboratory work. Spring. Staff.

223 SEMINAR IN ANTHROPOLOGICAL LINGUISTICS (Linguistics 223) (3). Selected topics from general linguistics and sociolinguistics, special emphasis on methods and problems involved in analysis and description of semantic structure of language and its relation to the rest of culture. Fall. (Alternate years.) Holland.

224 SEMINAR IN ANTHROPOLOGY AND CYBERNETICS (3). Examination of systems theory, or cybernetics; evaluation of previous applications of cybernetic models in anthropology; and original analysis of anthropological data in these terms by students. Fall. (Alternate years.) Daniels.

225 QUANTITATIVE METHODS IN ANTHROPOLOGY (3). Survey of standardized data-gathering techniques, problems in research design, and methods of quantitative analysis encountered in anthropological research. Fall. Holland.

226 QUANTITATIVE METHODS IN ARCHAEOLOGY (3). Introduction to quantitative and computer methods in archaeology. The course stresses exploratory data analysis and graphical pattern recognition techniques. Fall. Steponaitis.

233 ADVANCED SEMINAR IN CARIBBEAN STUDIES (3). Prerequisite, Anthropology 133 or permission of instructor. Survey of Caribbean cultural development for students with some knowledge or experience in the area. Particular attention is given to current problems and recent theoretical issues. Spring. Staff.

240 POWER (3). Theories of power within anthropology, from Marxism, poststructuralism, feminist studies, studies in race relations, cultural studies, others. Nonini.

244 SEMINAR IN ETHNICITY AND CULTURAL BOUNDARIES (3). Investigation of recent theoretical approaches to ethnic phenomena; consideration of cases ranging from tribal organization to complex industrial nations; analysis of particular ethnographic and ethnohistorical situations by individual students. Fall. (Alternate years.) Daniels.

249 STUDIES IN CULTURAL PRODUCTION (3). Critical examination of theories of social and cultural (re)production (e.g., Bourdieu's practice theory, cultural studies, and resistance theory) applied to enduring issues, e.g., the relations between power and gender, race and class. Spring. Holland.

250 SEMINAR IN MEDICAL ANTHROPOLOGY (3). Specially designed for, but not restricted to, students who are specializing in medical anthropology. Medicine as part of culture; medicine and social structure viewed cross-culturally; medicine in the perspective of anthropological theory; research methods. A special purpose is to help students plan their own research projects, theses, and dissertations. Spring. Partrick, Finkler.

251 SEMINAR ON THE ANTHROPOLOGICAL CONTRIBUTION TO THE UNDERSTANDING OF MEDICAL SYSTEMS (3). Anthropological contributions to the understanding of medical systems, sickness, and public health. Attention is given to the ways in which medical anthropology illuminates social processes, beliefs, and ideologies. Fall. Finkler.

252 TRANSCULTURAL PSYCHIATRY (3). Prerequisite, Anthropology 121, 170, or permission of instructor. Considers cross-cultural variations in the perception, definition of, and reaction to course and treatment of deviant behavior - especially mental disorders. Fall.
253 GENDER, SICKNESS, AND SOCIETY (Women's Studies 253) (3). This seminar deals in depth and cross-culturally with the nature of gender and the ways in which social comprehension of gender, gender status, and gender relationships impinge upon differential experience of health and sickness of men and women from a historical and contemporary perspective. Spring. Finkler.

254 PHENOMENOLOGICAL ANTHROPOLOGY (3). Prerequisite, permission of the instructor. The course aims to apply the theories and methods of phenomenology to the practice of anthropology. Fall. Evens.

255 SEMINAR IN CULTURAL ECOLOGY AND POPULATION (3). Mutual relationships of environment, social structure, mortality, and natality, reviewed in an evolutionary framework. Detailed consideration of a few school cultures; e.g., Bushmen, Tikopia, Ashanti, Japan, and Vicos (Peru). Spring. Staff.

256 THE EVOLUTION OF HUMAN COGNITION (3). Prerequisite, permission of the instructor. A critical exploration of contemporary evidence on the evolution of human cognition and consciousness, including phylogenetic, comparative (interspecific), ontogenetic, and cross-cultural perspectives. Spring. (Alternate years.) Holland and Winterhalder.

259 IDENTITY AND AGENCY (3). Sociogenic theories of identity, agency, and human consciousness - the works of Mikhail Bakhtin, Pierre Bourdieu, and others - examined ethnographically and cross-culturally in selected fields of social activity. Spring. Holland.

260 SEMINAR IN HUMAN EVOLUTIONARY ECOLOGY (3). Prerequisite, permission of instructor for undergraduates. Examination of evolutionary ecology concepts with existing or potential uses in human adaptation research including adaptation and optimization, effective environmental properties, foraging strategies, niche, competitive exclusion, life history tactics, and biogeography. (Alternate years.) Winterhalder.

265 SEMINAR IN THE ANTHROPOLOGY OF LAW (3). Prerequisite, permission of the instructor. Drawing upon recent work of social anthropologists, this course analyzes the nature of law and conceptions of authority in various Asian, African, and American preliterate societies. The course relates law with the economy, social organization, religious ideology, and political institutions of each society. Underlying theories of social cohesion and process are examined in detail. Fall. Conley.

266 SEMINAR IN ETHNOBOTANY (3). Prerequisite, permission of instructor. The focus is on economic plants and primitive technology. Ecological relationships between man and plants, and analysis and interpretation of archaeological plant remains. Some laboratory work is expected. Spring. Staff.

70 SEMINAR ON ANTHROPOLOGICAL PERSPECTIVES ON LATIN AMERICA (3). The seminar focuses on the interaction of five major issues in Latin America: class, ethnicity, gender, religion, and health. Fall. (Alternate years.) Finkler.

290 LINGUISTIC GEOGRAPHY (Linguistics 250) (3). (See Linguistics 250 for description.) Spring. Staff.

293 LINGUISTIC FIELD WORK I (Linguistics 293) (3). (See Linguistics 293 for description.) Fall. Staff.

294 LINGUISTIC FIELD WORK II (Linguistics 294) (3). (See Linguistics 294 for description.) Spring. Staff.

297 ART OF ETHNOGRAPHY (Folklore 297) (3). A field-based exploration of the pragmatic, ethical, and theoretical dimensions of ethnographic research, addressing issues of experience, aesthetics, and worldview through the lens of cultural encounter. Field research is required. Spring. Himon.

301 READING AND RESEARCH (1 to 4). Registration with permission of professor. Fall and spring. Staff.

302 READING AND RESEARCH (1 to 4). Registration with permission of professor. Spring. Staff.

310 SEMINAR IN THE ANTHROPOLOGY OF MEANING (1). Ongoing seminar for students and faculty participating in the Anthropology of Meaning concentration.

315 READING AND RESEARCH IN METHODOLOGY (1 to 4). Registration with permission of professor. Fall and spring. Staff.

316 READING AND RESEARCH IN METHODOLOGY (1 to 4). Registration with permission of professor. Spring. Staff.

317 THE CONCEPT OF TEACHING OF GENERAL ANTHROPOLOGY (3). Prerequisite, permission of associate chair. Directed course preparation and review of teaching techniques, films, and other aids. Fall. Staff.

318 TRAINING IN THE TEACHING OF ANTHROPOLOGY (3). Prerequisites, Anthropology 317 and permission of associate chair. The trainee teaches a small class in general anthropology under supervision. Fall and spring. Staff.

321, 322 FIELD RESEARCH (3 each). Registration with permission of the professor. Fall and spring. Staff.

327 SEMINAR IN SELECTED TOPICS (1 to 4). Fall. Staff.

328 SEMINAR IN SELECTED TOPICS (1 to 4). Spring. Staff.

393 MASTER'S THESIS (3 or more). Individual research in a special field under the direction of a member of the department. Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3 or more). Individual research in a special field under the direction of a member of the department. Fall and spring. Staff.

CURRICULUM IN APPLIED AND MATERIALS SCIENCES

SEAN WASHBURN, Chair
Otto Zhou, Associate Chair for Graduate Studies
Stephen Quint, Associate Chair for Undergraduate Studies

Professors
A. J. Bines (Orthopaedics) Cytomechanics, Cell-Cell Communication, Matrix Proteins
Joseph M. DeSimone (Chemistry) Polymeric Materials Synthesis
Robert P. Kesty (Orthodontics and Biomedical Engineering) Orthodontic Materials/Properties of Materials
Carol Lucas (Biomedical Engineering) Mathematical Modeling of Materials
Laurie E. McNel (Physics and Astronomy) Structure-Property Relations, Optical Spectroscopy
Royce W. Murray (Chemistry) Electron Transfer Active Polymer, Metal Clusters
Michael Rubinstein (Chemistry) Molecular Models of Polymers
Edward T. Samulski (Chemistry) Liquid Crystals and Liquid Crystal Polymers
Sean Washburn (Physics and Astronomy) Quantum Transport, Plasma Reactor Studies, Virtual Reality

Associate Professors
Jiaping Lu (Physics and Astronomy) Theoretical Studies of Materials
Nalin Parikh (Physics and Astronomy) Ion Beam Modifications and Analysis
Lu-Chang Qin (Physics and Astronomy) Synthesis and Structure of Nano-Materials
Richard Superfine (Physics and Astronomy) Interfacial Ordering of Molecules
Frank Tsui (Physics and Astronomy) Synthesis of Artificially Structured Materials
Yue Wu (Physics and Astronomy) Quasicrystals, Nanocrystals, Nanotubes and Molecular Motion in Polymers

Assistant Professor
Jeffrey Thompson (Dentistry) Development of Biomaterials

The Materials Science Program at the University of North Carolina at Chapel Hill is an interdisciplinary graduate program that brings together faculty from Physics and Astronomy, Chemistry, and various departments in the health sciences (including Dentistry, Orthopaedics, and Biomedical Engineering) to engage in research and training in Materials Science. The primary areas of emphasis in the program are electronic, nano, polymer, bio-materials. Students pursuing M.S. and Ph.D. degrees in Materials Science begin their studies with a core curriculum covering the fundamentals of...
materials including their structures, surfaces, fabrication, thermodynamics, and materials science laboratory techniques. They continue with elective courses offered by the curriculum or the participating departments as appropriate to their area of research concentration. Graduate students engage in research under the supervision of one of the participating Materials Science faculty in the Curriculum in Applied and Materials Sciences.

Research Interests
The four areas of research emphasized in the Materials Science program are electronic, nano, polymer and bio-materials. These four areas are not discrete, however, as research projects in electronic polymers, nonlinear optics of polypeptides on surfaces, liquid crystals, and wear in polyethylene artificial joints demonstrate. Individual faculty members may have research interests in more than one of the primary areas, and may collaborate with others to address all four. For detailed information, please contact the Curriculum Office at (919) 962-6293 or e-mail materials_science@unc.edu.

Degree Requirements
The Ph.D. degree requirements include completion of a suitable set of courses, cumulative written comprehensive exams, a preliminary doctoral oral exam, an original research project culminating in a dissertation, and a final oral exam. The M.S. degree requirements include completion of a suitable set of courses, cumulative written comprehensive exams, a research project and a final oral exam. The general regulations of the Graduate School govern credit hour, residency, and examination requirement.

Courses
All students must pass the following courses, or must have passed their equivalents elsewhere: Applied Sciences 141, Applied Sciences 143, and Materials Science 101, 102, 103, and 104. Each student also takes additional courses offered by the curriculum or participating departments, as appropriate for his or her area of study.

Comprehensive Exam
M.S. students must pass three core exams and one specialty exam. Ph.D. students must pass four core exams and two specialty comprehensive exams. Topics for the specialty exams will be research areas represented in Materials Science Program at UNC; core exams cover the fundamental knowledge of materials science. All students are required to complete the comprehensive exam by the second year.

Preliminary Doctoral Oral Exam
Students are required to select a research adviser and a thesis committee during the first year in graduate school. To pass the preliminary doctoral oral exam, students must present and successfully defend their Ph.D. research proposal to the thesis committee by the end of the second year.

Facilities and Equipment
Students and faculty in the curriculum have access to the following central facilities located in various departments: NMR (2), computer modeling and computer graphics, confocal microscopy, electron microscopy; glass shop, machine shop (2), laser lab, mechanical testing, mass spectroscopy, and X-ray diffraction. In addition, a variety of equipment is located in individual research laboratories. This includes equipment for thermal analysis; polymer synthesis; FTRIR, UV-Vis, Raman, and photoluminescence spectroscopy; ellipsometry; CVD; MBE; thermal oxidation; AFM; RBS and ion channeling; electrical measurements; nonlinear optics; low temperatures and high pressures. Facilities at North Carolina State University and MCNC are also available.

Fellowships and Assistantships
Teaching assistantships (with stipends of $12,225 for nine months) are available to qualified graduate students. The duties of assistants include teaching laboratory sections, assisting in the supervision of advanced laboratories, teaching recitation sections, and grading papers. Summer support is generally available. Research assistantships are also offered.

Courses for Graduates and Advanced Undergraduates
Materials Science 101 STRUCTURE AND PROPERTIES OF SOLIDS (3).
Prerequisite, permission of the curriculum. Introduction to the structure and properties of amorphous, crystalline, quasi-crystalline, liquid crystalline, and polycrystalline materials. Fall. Zhou.

Materials Science 102 MATERIALS FABRICATION (3).
Prerequisite, permission of the curriculum. Introduction of modern materials fabrication and characterization techniques. Topics include: single crystal growth, thin film deposition, synthesis of quantum dots and nanotubes/nanowires, dielectric and electron emissive materials, nanocomposites, bio-ceramics, and energy storage materials. Structure characterization techniques including diffraction, electron and scanning probe microscopy, and optical spectroscopy are introduced. Spring. Zhou.

Materials Science 103 STATISTICAL THERMODYNAMICS (Chemistry 184) (3).

Materials Science 104 TECHNIQUES IN MATERIALS SCIENCE (3).
Prerequisite, permission of the curriculum. Lecture and laboratory in materials analysis techniques, including microscopy, X-ray diffraction and fluorescence, magnetic resonance, thermal analysis, XPS, channeling and RBS, mechanical properties, optical spectroscopy. Spring. Faculty.

Materials Science 105 KINETICS, DIFFUSION AND PHASE TRANSITIONS OF MATERIALS (3).

Materials Science 121 SYNTHESIS OF POLYMERS (Applied Sciences 121, Chemistry 121) (3).
Prerequisites, Chemistry 51, 62 or 66H, and 62L. Synthesis and reactions of polymers. Fall. Chemistry faculty.

Materials Science 122 PHYSICAL CHEMISTRY OF POLYMERS (Applied Sciences 122, Chemistry 122) (3).
Prerequisites, Chemistry 120, 181. Kinetics of polymerization, molecular weight distribution and molecular weight measurements, solution properties, solid state properties of macromolecules. Spring. Chemistry faculty.

Materials Science 123 INTERMEDIATE POLYMER CHEMISTRY (Applied Sciences 123, Chemistry 123) (3).
Prerequisite, Applied Sciences 122. Rheology and mechanical properties of polymers; plastics, fiber, and elastomer technology. Spring. Chemistry faculty.

Applied Sciences 130 THERMODYNAMICS AND KINETICS APPLIED TO SOLIDS (3).
Prerequisites, Physics 27, Math 83. Applied Sciences 50. The elements of thermodynamics and phenomenological kinetics of diffusion appropriate to solids are examined. Topics include equations of state, heat capacity, polyphase equilibria, phase transitions, diffusion, and interfaces. Fall. Applied Sciences, Chemistry, Physics staff.

Materials Science 134 VISUALIZATION IN THE SCIENCES (Computer Science 134, Physics 134) (3).
Prerequisite, graduate student or senior in Computer Science or Natural Science major. Computational visualization applied in the natural sciences. For both computer science and natural science students. Available techniques and their characteristics, based on human perception; using software visualization toolkits. Project course. Taylor.
Materials Science 142 CHEMISTRY AND PHYSICS OF ELECTRONIC MATERIALS PROCESSING (Applied Sciences 142, Chemistry 192, Physics 144) 3. Prerequisites: Physics 160 or Physics 27, Chemistry 182, and permission of the instructor. A survey of materials processing and characterization used in fabricating microelectronic devices. Crystal growth, thin film deposition and etching and microphotography, characterization techniques, electric and dielectric properties of materials. Spring. Chemistry and Physics faculty.

Materials Science 143 CHEMISTRY AND PHYSICS OF SURFACES (Applied Sciences 143, Chemistry 193) 3. Prerequisite: Applied Sciences 141. The structural and energetic nature of surface states and sites; experimental surface measurements; reactions on surfaces including bonding to surfaces and adsorption; interfaces. Spring. Chemistry and Physics faculty.

Materials Science 169 INTRODUCTORY SOLID STATE PHYSICS (Physics 169) 3. Prerequisite, Physics 160 or equivalent. Crystal symmetry, atomic structure of crystalline and non-crystalline solids, and imperfections in crystals; atomic bonding and types of atomic bonds in solids; electron and mechanical waves in solids; thermal, electrical, optical, and magnetic properties of solids; electronic structure and superconductivity of solids. Fall. Qn.

Materials Science 200 SPECIAL TOPICS IN MATERIALS SCIENCE (2 or 3). Prerequisite, permission of the instructor. Current topics in materials science, including electronic and optical materials, polymers, and biomaterials.

Materials Science 242 DEVICE PHYSICS AND ELECTRONIC PROPERTIES OF SOLIDS (3). Prerequisite, Physics 169 or Applied Sciences 141, Materials Science 101, Materials Science 103, or permission of the instructor. Survey of crystal structure, band structure, transistors, photodetection, light emission, dissipation, noise, integrated circuits, solar cells and ceramics. Emphasis on physical sources of device behavior.

Materials Science 245 OPTICAL PROPERTIES OF SOLIDS (3). Prerequisite, Applied Sciences 141 or Physics 169, Physics 106, or permission of the instructor. Reflection, waveguides, nonlinear optics, optical switching, photorefractive, optical storage. Optical coupling to electronic states, device applications, optical computing.

Materials Science 249 ION-SOLID INTERACTIONS (3). Prerequisite, Applied Sciences 141 or Physics 169 or permission of the instructor. Interatomic potentials, range distribution, radiation damage, annealing, secondary defects, analytical techniques, silicon-based devices, implantation in compound semiconductors, and buried layer synthesis. Ion implantation in metals, ceramics, polymers and biomaterials.

Materials Science 250 NEW TECHNOLOGIES AND DEVICE ARCHITECTURE (3). Prerequisite, Physics 169 or Applied Sciences 141, Materials Science 101, Materials Science 103 or permission of the instructor. Survey of novel and emerging device technologies. Resonant tunneling transistors, HEMT, opto-electronic devices and optical communication and computation, low-temperature electronic, hybrid superconductor devices.

Materials Science 270, 271 SOLID STATE PHYSICS (Physics 270, 271) 3 each. Prerequisite, Physics 160 or equivalent. Topics considered include those of Physics 169, but at a more advanced level, and in addition a detailed discussion of the interaction of waves (electromagnetic, elastic, and electron waves) with periodic structures; e.g., X-ray diffraction, phonons, band theory of metals and semiconductors. Fall and spring. Hernandez.

Materials Science 393 MASTER'S THESIS (variable). Prerequisite, permission of the curriculum.

Materials Science 394 DOCTORAL DISSERTATION (variable). Prerequisite, permission of the curriculum.

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DEPARTMENT OF ART

MARY C. STURGEON, Chair
Dorothy Verkerk, Assistant Chair for Art History
Jim Hirschfield, Associate Chair for Studio Art

Professors
Jaroslav Fogla (10) Crusader and Gothic Medieval Art
Elizabeth Grabowski (68) Printmaking, Painting, Drawing
Jim Hirschfield (82) Sculpture
Richard Kinnard (11) Painting, Drawing
Arthur Marks (21) American, British Art and Architecture
Carol Mavor (94) Critical Theory, Modern Art
Jerry Nye (13) Sculpture
Mary Sheriff (56) Eighteenth, Nineteenth, and Twentieth Centuries
Mary Sturgeon (31) Ancient Art, Archaeology
Dennis Zaborowski (15) Painting, Drawing

Associate Professors
Juan Logan (155) Painting, Sculpture
Yan-Dong Nam (128) Ceramic Sculpture
Mary Pardo (62) Italian Renaissance
Elisabeth Hara slavick (118) Mixed Media
Dorothy Verkerk (123) Late Antique, Celtic, Early Medieval

Assistant Professors
Tammy Rae Carland (136) Photography, Video, Digital Imaging
Michael Cole (143) Baroque Art
Pika Ghosh (144) South Asian Art
Michael D. Harris (131) African, African American Art
Kimowan McLain (152) Painting
Joyce Rudinsky (150) Digital Art

Adjunct Professors
Timothy Riggs (65) Sixteenth-, Seventeenth-, and Twentieth-Century Prints

Adjunct Associate Professor
Gerald D. Bolas (126) American Art, Modern Japanese Art; Museum Studies

Adjunct Assistant Professors
Barbara Matlacky (139) Curator of Exhibitions
Sarah W. Schrott (95) Southern Baroque Art, Spanish Art
Carolyn Wood (114) Italian Baroque Art

Adjunct Instructors
Evelyn Koehnline (106) Conservation of Art on Paper
Rebecca Martin Nagy, Medieval Art, Modern, Ancient Art
Mary Ellen Sides, Ancient Art
David H. Steel Jr., European Art
Dennis P. Weller, European Art
Instructor/Photo Technician
Jeff Thetstone, Photography

Professors Emeriti
Robert Barnard
James Gaden
Frances Huemer
Sara Immerwahr
J. Richard Judson
Kenneth Nes
Marvin Saltman
For those considering professional careers as critics, art historians (teaching and research), or in museum work, graduate work is offered leading to the degree of Master of Arts and Doctor of Philosophy. Those desiring to become professional artists should take the degree of Master of Fine Arts.

The Hanes Art Center provides exhibition galleries, a departmental library, a slide and photograph collection, offices, study areas, classrooms, and studios. Additional studios and shops are located in the Art Laboratory building on Airport Drive, one mile from campus.

The Joseph C. Sloane Art Library has a collection of 90,000 volumes and is supplemented by the University's Academic Affairs libraries with holdings of over 4,000,000 volumes. The Sloane Art Library collection provides computer terminals for catalogs and houses the reserve holdings for Art Department courses. Graduate students have access to the departmental archives of slides and photographs with current holdings of 220,000 slides and 40,000 photographs.

One feature of the department is its access to the Ackland Art Museum in the adjacent building. A growing collection of works of art in all media offers the opportunity for students to work on research problems using actual objects. Frequent exhibitions provide further opportunities for study. The museum offers a graduate assistantship and other opportunities for paid and volunteer work in collections research and museum education.

Admission
Deadline for applications for consideration for graduate school fellowships and assistantships is December 1. Graduate School application may be submitted via the online application for admission (www.adp.unc.edu/sis/admissions/grad/gradhome.html). This user-friendly, online application is faster and easier than completing a paper application and provides for the prompt receipt and distribution of application information. Individuals with special needs, or Internet access problems, can request paper information via this same site or by phoning (919) 962-1538.

**Master of Fine Arts (M.F.A.).** Applications are welcome from students holding a bachelor's degree in art or from students with an undergraduate degree in another field who present a strong portfolio in art. A background of at least one basic-level course and one intermediate-level course is necessary to prepare the applicant adequately for the required graduate-level courses in art history and a cognate field. In addition to the UNC-Chapel Hill application, applicants to the M.F.A. program must submit directly to the Department of Art a portfolio of representative examples of creative work. Fifteen to twenty slides, adequately identified and labeled, are required and should be enclosed in plastic slide sheets. Applicants should not send original works. A slide description sheet noting dimensions, media, and date of each piece should be included. A statement of purpose (i.e., reasons for pursuing graduate study in studio art) should also be submitted. Portfolios of those admitted become property of the department and are retained in the student's file. The portfolios of applicants who are not offered admission will be returned if accompanied by a self-addressed stamped envelope. The GRE is not required for application to the M.F.A. program.

**Master of Arts (M.A.) and the Doctorate (Ph.D.).** In addition to completing an application to the Graduate School (which must include up-to-date GRE scores), the candidate for admission to the programs in art history must submit directly to the Department of Art the departmental Self-Interview Form, available as a supplement with the online Graduate School application or upon request to the Department of Art, a statement of purpose, which is explained on the Self-Interview Form, and an example of his/her written work. The writing sample should be no more than fifteen pages. All applicants for graduate study in art history are admitted to the program as candidates for the Master of Arts degree unless they have already received or expect to receive the M.A. degree in art history from another institution. An undergraduate major in art history is not required for M.A. candidacy; however, entering candidates, as a rule, have taken an average of twenty-one semester hours in art history. Courses in archaeology, cultural anthropology, and aesthetics are also considered in the admission process. At the time of application the candidate is expected to have a reading competency in either a romance language or German; a student entering with an M.A. should have reading competency in both a romance language and German.

There are no spring semester admissions in either studio art or art history.

**Degree Requirements for Studio Art**

The Master of Fine Arts degree at UNC-Chapel Hill is a two-year, sixty-hour program. The majority of credits (thirty-one) are earned as independent study and critiqued under the direction of a resident professor adviser. Further interaction with the studio faculty is mandated through a series of critiques/reviews. In the first year, students interact with the whole studio faculty in a series of scheduled individual meetings. In the second year students select a thesis committee composed of at least three members, two of whom must come from the studio faculty. This implies that students can have representation of faculty on the thesis committee from outside the art department. Through interaction with faculty both within the art department and in the University at large, students are guided technically and intellectually toward producing work that reflects the unique and personal conviction of the artist/student.

Believing that technique must serve the visual ideas, faculty stress the image-making/conceiving process as integral to the execution of the work. As each student understands his or her own point of view with regard to issues being addressed in the work, faculty serve as guides and instructors in techniques when necessary and appropriate. Given this approach, students do not necessarily choose a particular media for specialized concentration. Determinations of media focus are arrived at through an examination of aesthetic and conceptual goals. This does not preclude a media focus, just that any choices made must be considered as part of the students' intellectual and aesthetic explorations.

Additional studio credits (eight) are in the form of the Graduate Critique held with the artist-in-residence. The department invites a nationally recognized artist to be a member of the faculty each semester.

The academic component of the M.F.A. program is designed to complement the main purpose of making art. The program operates under the philosophy that the decision to pursue the making of fine art in an academic context carries an attendant responsibility to develop the verbal and written articulation of the visual. To accomplish this goal, students participate each semester in a graduate seminar (twelve credit hours), conducted by the artist-in-residence. Contemporary critical issues including social, cultural, political, and aesthetic ideas surrounding the making of art are explored and debated in this group forum. This also provides an opportunity for young professionals to interact with accomplished, successful artists, working in a variety of contexts.

A continuation of this more traditional academic endeavor is accomplished by a requisite six hours of additional course work in art history and/or related fields. Course selections are made depending on the focus of the individual student's research; selected courses will supplement and stretch the potential of the creative work from an academic perspective. Usually students are urged to take one of these courses in the area of twentieth-century art history. The remaining hours (three) are Master's Thesis, taken in the final semester. The thesis hours basically constitute the preparation of the thesis exhibition and writing the thesis document.
The conclusion of the M.F.A. program is the group exhibition of the thesis work produced under the direction of the thesis committee. Students write a thesis document/statement to accompany the thesis work. A final oral defense takes place during the time of the exhibition. Once the oral defense has been passed, students submit a copy of the thesis statement along with slide and photo documentation of the thesis work for permanent retention in the Sioane Art Library.

An additional feature of the UNC Master of Fine Arts program is the Hanes Visiting Artist Lecture Series. This program has proved to be a vital conduit for graduate students to see the work of and interact with a large and diverse number of professional artists. The artists are typically invited to campus for a two-day visit in which they give a public lecture and then give private critiques for the graduate students.

Financial Aid for Studio Art Students

All applicants for admission to the M.F.A. program whose applications are complete by January 1 are automatically considered by the department for nomination in the University fellowship competition. Applicants and students in residence are eligible for teaching assistantships and graduate assistantships that are awarded on a semester basis. Students desiring financial aid should consult as early as possible The Office of Scholarships and Student Aid, CB# 2300, Vance Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-2300, for information about work-study jobs and loans.

Degree Requirements for Art History

Master of Arts Degree

The Master of Arts degree generally follows the requirements of the Graduate School as described in the section on graduate degree requirements in the Graduate School Handbook.

The M.A. degree requires eleven courses over a two-year period (four semesters). During the first three semesters, students take nine courses of which two may be taken in other departments. All students are required to take Methods (Art 276) during their first semester. Of the remaining eight courses, at least four must be 300-level seminars. The other four can be 100- and 200-level courses, although students are encouraged to take as many 300-level courses as possible. At least four of the remaining eight courses must fall within four of the five distribution areas noted:

Group 1: Ancient Greek, courses cross-listed with Classics, Celtic
Group 2: Medieval
Group 3: Renaissance and Baroque
Group 4: Eighteenth-, Nineteenth-, Twentieth-Century European and American, African American
Group 5: Asian, Asian, South Asian, Post-Colonialism

In the fourth semester, students must sign up for Art 393 (thesis registration) and Art 280 (thesis writing seminar).

By the end of the third semester, all M.A. students are required to demonstrate proficiency in either German or a Romance language by obtaining a passing grade on the UNC-Chapel Hill reading competency examination, or by passing German 102x or French 102x (graduate reading courses offered by the departments of Germanic Languages and Romance Languages, respectively).

At the start of the third semester, students must take the M.A. slide exam. Students will not be allowed to register for Art 393 or Art 280 until they have passed the slide exam.

Master's Thesis

By October 1 of the second year, the M.A. student must submit a thesis proposal signed by his or her committee. (The committee consists of an adviser plus two other readers. Two of the three must be permanent Art History faculty.) The master's thesis is completed by the end of the fourth semester.

Formal acceptance of an M.A. thesis by the student's adviser and two additional readers concludes the M.A. course of study. If the student wishes to continue into the Ph.D. program, he or she should notify the department of that intention at the time of the M.A. examination in order to allow a full evaluation of his or her graduate work by the Art History Graduate Committee. A student may not continue in the Art History graduate program for more than one semester beyond thirty hours of graduate credit unless approval is granted by the graduate committee for entrance into the Ph.D. program.

Doctor of Philosophy Degree

The degree of Doctor of Philosophy generally follows the requirements of the Graduate School as described in the section on graduate degree requirements in the Graduate School Handbook.

Students are required to take ten three-hour courses, a total of thirty hours, all of which are beyond those completed for the M.A. At least four of these courses should be 300-level seminars, and the final course must be Art 394 (Dissertation Registration). Students sign up for Art 394 during their fourth semester when they are taking their Ph.D. exams. With the permission of the Director of Graduate Studies, two of the ten courses may be taken in other departments as electives for supplementary and complementary studies.

In organizing courses, Ph.D. students should consider their preliminary examinations carefully and study closely with at least two members of the permanent Art History faculty.

Ph.D. students may elect to complete an External Minor. This consists of at least three more courses in the external field (the minor department) such as History, Communication Studies, or English, and will require an additional semester of course work. Students must secure prior approval of the minor department in order to take the minor.

The Ph.D. requires demonstration of proficiency in German and one Romance language. Proficiency is usually demonstrated by obtaining a passing grade on the UNC-Chapel Hill reading competency examination, or passing German 102x or French 102x.

Ph.D. students should be aware that although they are not formally required to have a command of any additional languages, their advisers may determine that other languages (e.g., Latin, Greek, Hindi) are necessary in order to advance their research.

Students take written and oral preliminary exams the semester after they complete their Ph.D. course work (except for Art 394).

Upon successful completion of the written exam and the First Doctoral Oral Examination, students become A.B.D. (all but dissertation) and begin the actual writing of the dissertation. Once the dissertation is completed (approximately two to three years after the first doctoral oral examination) students seek approval of their adviser and the examining committee for the final oral defense of the finished dissertation.

A doctoral candidate has eight calendar years from the date of first registration in the Ph.D. program to complete the doctoral degree. For the doctoral candidate there is a minimum residence credit requirement of four semesters; at least two semesters must be earned through continuous full-time registration on this campus.
For further information the applicant should write to the director of graduate studies in Art History.

Financial Aid for Art History Students
All applicants for admission who have completed their applications by December 1 are automatically considered by the department for nomination in the University Fellowship competition. Applicants and students in residence are also eligible for teaching and research assistantships, which are awarded by the department with University funds. Furthermore, the department has certain discretionary funds of its own from which it makes annual service and nonservice awards. A limited amount of hourly work is available to graduate students in the art library and slide library. Students desiring financial aid should consult as early as possible The Office of Scholarships and Student Aid, CB# 2300, 300 Vance Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-2300, for information about work-study jobs and loans.

Art History
Courses for Graduates and Advanced Undergraduates

110 TOPICS IN THE HISTORY OF ANCIENT ART (3). Sturgeon.
111 TOPICS IN THE HISTORY OF EARLY MEDIEVAL ART (3). Folda, Verkerk.
112 TOPICS IN MEDIEVAL ART: A.D. 1000-1453 (3). Folda, Verkerk.
113 TOPICS IN RENAISSANCE ART (3). Pardo.
114 TOPICS IN BAROQUE ART (3). Cole.
115 TOPICS IN MODERN ART (3). Marks, Sheriff, Mavor, Harris.
116 TOPICS IN MODERN DESIGN (3).
118 AFRICAN ART TOPICS (AFRI 118) (3). Harris.
119 TOPICS IN AMERICAN ART (3). Marks, Harris.
120 EARLY MODERN SCULPTURE (3). Cole.
124 TOPICS IN FAR EASTERN ART (ASIA 124) (3).
128 ART AND RITUAL IN SOUTH ASIA (ASIA 128) (3). Ghosh.
145 COLLABORATIVE VISUAL ETHNOGRAPHIC PROJECTS (ANTH 136) (3).
149A CONSTANTINOPLE: THE CITY AND ITS ART (CLAR 149A) (3). Connor.
149B IN CONSTANTINOPLE (CLAR 149B) (3). Connor.
150 ROMANESQUE ARCHITECTURE (3).
151 WOMEN IN THE VISUAL ARTS (3). Sheriff.
152 GOTHIC ARCHITECTURE AND SCULPTURE (3).
153 HISTORY OF ILLUMINATED MANUSCRIPTS (3). Folda, Verkerk.
154 NORTHERN EUROPEAN ART: A.D. 1300-1500 (3). Folda.
155 CELTIC ART (3). Verkerk.
160 RENAISSANCE ART IN VENICE (3). Pardo.
161 BAROQUE ARCHITECTURE (3).
162 SIXTEENTH-CENTURY ITALIAN PAINTING (3). Pardo.
162A SEVENTEENTH-CENTURY FRENCH AND FLEMISH PAINTING (3). Staff.
163 SIXTEENTH-CENTURY VENETIAN PAINTING (3). Pardo.
164 THE ART OF FLORENCE (3). Pardo.
165 SIXTEENTH-CENTURY DUTCH AND FLEMISH ART (3).
170 SEVENTEENTH-CENTURY LOW COUNTRY ART (3).
171 ITALIAN BAROQUE PAINTING (3).
172 SEVENTEENTH-CENTURY FRENCH AND FLEMISH ART (3). Staff.
173 EIGHTEENTH-CENTURY FRENCH PAINTING (3). Sheriff.
174 ART, MYTH, AND NATURE (ANTH 134) (FOLK 134) (3). Johnson.
178 TOPICS IN AFRICAN AMERICAN ART (AFAM 178) (3). Harris.
180 THEORIES OF MODERN ART (3). Mavor.
181 MODERN ART AND CRITICISM (3). Mavor.
182 MOSAICS: THE ART OF MOSAIC IN GREECE, ROME, AND BYZANTIUM (CLAR 182) (3). Connors.
183 CONNOISSEURSHIP (3). Bolas, Riggs, Koehnline, Wood.
184 MUSEUM STUDIES (3). Bolas, Riggs, Koehnline, Wood.
185 THE LITERATURE OF ART (3). Staff.
186 TOPICS IN THE HISTORY OF ART (3). Staff.
187 STUDIES IN THE HISTORY OF GRAPHIC ART (3). Riggs.
189 STUDIES IN NEAR EASTERN ARCHAEOLOGY (CLAR 189) (3).
190 GREEK ARCHITECTURE (CLAR 190) (3). Sams.
191 ARCHITECTURE OF ETRURIA AND ROME (CLAR 191) (3).
192 THE GARDENS, SHRINES, AND Temples OF JAPAN (ANTH 196) (ASIA 196) (3). Johnson.
193 GREEK PAINTING (CLAR 193) (3). Sturgeon.
194 ARCHaic GREEK SCULPTURE (CLAR 194) (3). Sturgeon.
195 CLASSICAL GREEK SCULPTURE (CLAR 195) (3). Sturgeon.
196 HELLENISTIC GREEK SCULPTURE (CLAR 196) (3). Sturgeon.
198 AEGEAN CIVILIZATION AND NEAR EASTERN BACKGROUNDS (CLAR 198) (3).
199 READINGS IN ART HISTORY (3). Staff.

The content of these courses varies slightly from year to year in accordance with the needs of the students and the special competence of the instructor.

Courses for Graduates
In the seminars listed, the topics for study change from year to year depending on the professor conducting the course. Architecture, sculpture, painting, or a combination of these may be the subject. Consult the department schedule for details on specific courses in any given semester.

201 MEDIEVAL STUDIES (3). Folda, Verkerk.
251 GENDER AND VISUAL CULTURE (WMST 251) (3). Sheriff, Mavor.
276 ADVANCED READINGS TOPICS IN THE HISTORY OF ART (3).
280 Master's Thesis Writing Seminar (3).
294 Greek Topography (CLAS 294) (3).
296 Roman Sculpture (CLAS 296) (3).
297 Roman Painting (CLAS 297) (3).
298 Roman Topography (CLAS 298) (3).
299 Etruscan Art (CLAS 299) (3).
301 Topics in the History of Art (3). Staff.
310 Seminar in Architecture (3).
350 Seminar in Medieval Art (3). Folda.
351 Seminar in Medieval Art (3). Verkerk.
352 Seminar in Renaissance Art (3). Pardo.
353 Seminar in Renaissance (3). Pardo.
354 Seminar in Baroque Art (3). Cole.
356 Seminar in American Art (3). Marks, Harris.
357 Seminar in Modern Art (3). Mayor, Sheriff, Harris.
358 Seminar in Ancient Art (CLAS 358) (3). Snugge.
359 Seminar in African Art (3). Harris.
360 South Asian Art (3). Ghosh.
378 Seminar in Museum Studies (3).
393 Master's Thesis (3 or more).
394 Doctoral Dissertation (3 or more).

Studio Art

Courses for Graduates
230 Graduate Studio Art Seminar (3).
231/232 TA Practicum (5).
240 Graduate Studio (Var.).
250 Graduate Critique (2).
393 Master's Thesis (3 or more).

DEPARTMENT OF BIOCHEMISTRY AND BIOPHYSICS

DAVID C. LEE, Chair

Professors
David A. Brenner (11) Signaling and Gene Expression under Normal and Pathological States, Animal Models and Gene Therapy for Genetic Diseases
*Michael Caplow (16) Chemistry of the Microtubule Cytoskeleton
*Stephen G. Chaney (25) Chemistry and Action Mechanism of Platinum Anticancer Agents, DNA Repair, Effects of DNA-Damaging Agents on DNA Replication

*Stephen Crews (24) Molecular Genetics of Nervous System Development, Transcriptional Control, Evolution of Regulatory Mechanisms
Marshall Edgell (143) Use of Biophysical and Genetic Techniques Using Combinatorial Libraries and High Throughput Robotics to Assess Determinants of Protein Structure
*Beverly Errede (144) Function and Regulation of MAP-Kinase Activation Pathways in Saccharomyces cerevisiae
Jack Griffith (41) Architecture of DNA-Protein Complexes Involved in Replication, Repair, and Telomere Maintenance, Electron Microscopy
*Jan Hermans (46) Theoretical Approaches to Structure and Function of Proteins: Computer Modeling, Molecular Dynamics, and Molecular Graphics
*Hengming Ke (50) X-ray Crystallography, Structure and Function of Biologically Important Proteins Such As Phosphodiesterase and Molecular Chaperone System
*David C. Lee (56) Growth Factors and Receptors, Molecular Oncogenesis, and Proteolytic Regulation of Cell Surface Proteins
*Barry R. Lentz (62) Biomembrane Structure and its Relationship to Function, Platelet Membranes in Blood Coagulation, Membrane Fusion, Liposomes
*Patricia F. Maness (68) Mechanisms of Cell Signaling and Adhesion, Axon Guidance and Synaptic Plasticity
*William F. Marzluff (69) Control of Gene Activity, Cell-Cycle Regulation in Early Embryos, Control of Expression of Histone mRNA
*Gerhard W. Meisner (79) Intracellular Ca2+ Signaling and Regulation of Ion Channels in Strytiny Muscle
*Pierre Morel (85) Neurochemistry: Gene Expression Related to Myelin Metabolism, Mechanisms of Demyelination, Brain Lipid Metabolism, Neurotoxicology
Gary Pielak (99) Protein Structure/Function Using 2-D NMR
*Brian J. Popko (101) Molecular Neurobiology, Transgenic Mice
Aziz Sancar (105) DNA Repair and Cancer, Structure and Function of DNA Repair Enzymes, Molecular Neurobiology, Reaction Mechanism of Human Blue-Light Photoreceptor
*Gwendolyn B. Sancar (104) Cellular Responses to Genotoxic Stress, DNA Repair, Transcriptional Regulation of Stress Response Genes
*Roslind S. Swanson (123) Molecular Biology of HIV, Resistance to HIV Protease Inhibitors
Michael D. Topal (126) Protein-DNA Recognition, Genomic Instability
*Thomas W. Trout (128) Enzyme Structure and Regulation, Allosteric Dissociating Enzymes
*Terry Van Dyke (132) Molecular Regulation of Cell Growth Control, Cell Specificity of Tumor Suppression Function, Gene Regulation
Elizabeth M. Wilson (134) Mechanisms of Steroid Hormone Action, Androgen Regulation of Gene Transcription
*Richard V. Wolfenden (139) Enzyme Mechanisms, Water Affinities of Biological Compounds

Associate Professors
*Sharon Campbell (18) NMR Spectroscopy, Structure and Regulation of Proteins Involved in Ras-Mediated Cell Signaling
Ed Collins (23) Use of Biophysical Tools to Study Immunological Problems Focusing on Immune Recognition of Cancer
*Henrik Dohlman (17) Regulators of G Protein Signaling, Mechanisms of Drug Desensitization
*Ann Erickson (33) Cellular Protein Targeting, Lysosomal Enzyme Biosynthesis, Secretion of Lysosomal Proteases by Transformed Cells
*Howard M. Fried (39) Cell and Molecular Biology, Mechanisms of Nuclear-Cytoplasmic Transport, Mechanisms of RNA-Protein Recognition
*Yue Xiong (140) Molecular Mechanisms of Cell Cycle Control, Tumor Suppression and Development
Wendell Yarbrough (153) Regulation of Cell Cycle and Apoptosis in Head and Neck Cancer
Assistant Professors

*Christopher Bocarsly (12) Protein-Protein and Protein-Ligand Interaction, Protein Tertiary Structure, Quaternary Structure of Multi-Protein Complexes, Structure-Function Relationship of Proteins, Functional Proteomics

*Lyndon Cooper (21) Osteoblast Responses to Physiological Stress: Characterization of the Heat Shock Response and Mechanochemical Deformation and Stimulation

Andrew Lee (71) Protein, Structure and Dynamics, NMR Spectroscopy

*Dale Ramsden (108) Mechanism of V(D)J Recombination, End-Joining Pathway for Repair of DNA Double Strand Breaks

Matthew Redinbo (110) Structural Biology of Proteins and Protein-nucleic Acid Complexes

*Brian Strahl (120) Mechanisms of Chromatin-Mediated Gene Transcription

*Yi Zhang (138) Chromatin Dynamics, Gene Expression, Cellular Proliferation

Research Professors

David G. Kaufman (53) Cellular and Molecular Mechanisms of Cancer Development, Epithelial Cell-Stromal Cell Interactions, Cell-Cycle Influences on Carcinogenesis

*Areli D. Toews (125) Neurochemistry, Neurotoxicology: Metabolism and Gene Expression during Denervation and Reinnervation, Molecular Biology of Cholesterol Metabolism and Trafficking

Professors Emeriti

Michael K. Berkut

Edward B. Glassman

David J. Holbrook Jr.

William Henry Pearlman

Ralph Penniall

Howard A. Schneider

George K. Sumner

Robert H. Wagner

James R. White

John E. Wilson

*core faculty members

The Department of Biochemistry and Biophysics is an administrative division of the School of Medicine and a member of the Graduate School. The graduate program offers instruction and research opportunities leading to the Ph.D. degree. Although the department offers the M.S. degree, the graduate program is not designed as a terminal master's curriculum. Applicants are offered admission with the expectation that they will complete their doctorate.

Modern research in biochemistry and biophysics is designed to address mechanism and function; it utilizes the paradigms of molecular biology, but is influenced by chemistry, physics, and genetics. The philosophy of the department and its graduate program is to provide students with broad training in modern approaches to the field and unique opportunities for multidisciplinary training.

Curriculum

Students admitted to the graduate program take any two of the following five courses: Biochemistry 104, 110, 111, 117, 118, 134, or any three of the physical biochemistry modules (Biochemistry 144-157). In addition, all students take a special seminar course (Biochemistry 205) and select a minimum of three laboratory rotations (Biochemistry 207). These four core courses can be completed during the first year when a student has all prerequisites. A scientific writing course, Biochemistry 212, is required during the second year. This course is designed to prepare students for the Comprehensive Examination, which is in the format of an NIH grant proposal. Students are also required to take a minimum of twelve semester hours of electives, including at least three three-hour lecture courses. The remainder of the electives can be either seminar or lecture courses. The electives may be courses offered either by the Department of Biochemistry and Biophysics or by other departments. Further information on course requirements may be found in the Guidelines for Students in the Graduate Program in Biochemistry and Biophysics at The University of North Carolina at Chapel Hill.

Students in the combined M.D./Ph.D. program are required to complete two of the following courses (six credit hours): Biochemistry 110, 111, 117, 118, 134, or any three of the physical biochemistry modules (Biochemistry 144-157), as well as Biochemistry 205 (three credit hours), two rotations in Biochemistry 207 (four credit hours), and Biochemistry 212 (two credit hours). School of Medicine courses can serve in lieu of electives.

A faculty committee advises entering students about course selection until the student chooses a research sponsor. Students select research sponsors from the department's primary and joint faculty members following the three laboratory rotations. After a research sponsor has been selected, a research guidance committee is formed to review the student's yearly progress. The examinations required for admission to candidacy for the Ph.D. are administered as a comprehensive exam and a written research proposal. The comprehensive exam will cover major topics in the areas of biochemistry/biophysics and cell/molecular biology. The written research proposal will be on the student's chosen research project and will be defended in an oral examination. The most important requirement for the Ph.D. degree is a dissertation of original research carried out independently by the candidate. The Ph.D. candidate is required to conduct a final oral defense of a dissertation.

Financial Aid and Admissions

Funds available from the University, the department, and individual research grants provide stipends for students. All applicants are considered for special fellowships and teaching or research assistantships. In 2001 students received a stipend of $18,000 plus in-state tuition and fees. Major medical insurance was also provided. Nonresidents with predoctoral fellowships or assistantships are recommended for special tuition rates. Applications are considered from prospective graduate students who present evidence of superior scholarship in biology, chemistry, or biochemistry. The department recommends that students prepare themselves by taking general and organic chemistry, biochemistry, biology, physics, and calculus. It is anticipated that students who have not had these courses will take them, as appropriate, after their arrival. Application forms for admission and departmental information may be obtained by writing to the director of graduate studies of the department of Biochemistry and Biophysics, or through the department's website: www.med.unc.edu/wrkunits/2depts/biochem.

Research Interests

The faculty research interests are diverse and include research in the following areas: cell signaling and growth control, DNA repair and replication, membrane biophysics and function, molecular regulation including transcriptional control, nervous system development and function, and protein structure/function, including enzymology. Model systems used by the faculty range from bacteria to mammals; techniques span molecular biology to physical biochemistry. A brochure describing the department and more detailed faculty research interests can be obtained by writing to the director of graduate studies of the department of Biochemistry and Biophysics, or by visiting the department's website: www.med.unc.edu/wrkunits/2depts/biochem.
Facilities

The departmental research facilities are centered in the Mary Ellen Jones building, which is within walking distance of the Cancer Research Center and the departments of Biology, Chemistry, and Physics. The building is equipped with instrumentation for molecular biological, biochemical, structural, and biophysical research. Animal-care facilities are available to support the department's research endeavors. The computer facilities are networked within the department, to the Research Triangle area, and to national and international databases. Color graphics workstations (including an E&S PS350) and high-speed minicomputers are available within the department.

Courses for Graduates and Advanced Undergraduates

102 UNDERGRADUATE RESEARCH IN BIOCHEMISTRY (1-3).
Prerequisites, an overall 3.0 G.P.A. and permission of course director. For juniors and seniors who wish to carry out an independent, mutually arranged research project in the laboratory of a biochemistry faculty sponsor. Restricted to on-campus work. Minimum three hours per week for each unit of credit per semester. May be repeated. May not substitute for honors, advanced elective, or other course requirements of another department. A written report is required in each term. Fall and spring. Fried, staff.

103 BIOCHEMISTRY FOR DENTAL STUDENTS (5).
Prerequisite, Chemistry 62 or equivalent. This course may be taken by qualified students who are not majoring in biochemistry. Fall. Staff.

104 ENZYME PROPERTIES, MECHANISMS, AND REGULATION (3).
Prerequisite, Chemistry 130 or equivalent. Focuses on enzyme architecture to illustrate how the shapes of enzymes are designed to operate the catalytic step and become allosterically modified to regulate the rate of catalysis. Fall. Taat, Woldfend.

105 MOLECULAR BIOLOGY (3).
Prerequisites, undergraduate biochemistry or genetics, and organic chemistry. Techniques in molecular biology, mechanisms of DNA replication, transcription, and translation of genetic material in prokaryotic and eukaryotic systems; genomics, gene organization, regulatory and signaling mechanisms; and molecular biology of cancer. Fall. Crews, Fried, Van Dyke, Xiong.

110 ADVANCED MOLECULAR BIOLOGY I (Microbiology 108) (Genetics 110) (Pharmacology 130) (Biology 178) (3).
Prerequisites, at least one undergraduate course in both biochemistry and genetics and permission of the instructor. DNA structure, function, and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair, and genome fluidity. Fall. Griffith, Matson, A. Sancar.

111 ADVANCED MOLECULAR BIOLOGY II (Microbiology 109) (Genetics 111) (Pharmacology 137) (Biology 179) (3).
Prerequisites, at least one undergraduate course in both biochemistry and genetics and permission of the instructor. RNA structure, function, and processing in biological systems including transcription, gene regulation, translation, protein and RNA transport. Spring. Baldwin, Marshall, staff.

117 CELL STRUCTURE, FUNCTION, AND GROWTH CONTROL I (2 or more).
Prerequisites, undergraduate cell biology or biochemistry or permission of instructor. Comprehensive introduction to cell structure and function. Fall. Meissner, staff.

118 CELL STRUCTURE, FUNCTION, AND GROWTH CONTROL II (2 or more).
Prerequisites, undergraduate cell biology or biochemistry or permission of instructor. Comprehensive introduction to cell structure, function, and transformation. Spring. Cox, staff.

125 PLANT PHYSIOLOGY AND BIOCHEMISTRY (Biology 125) (3).
Prerequisites, Biology 11 and Biology 41 or 52. An advanced course covering growth of plants including photosynthesis, nitrogen fixation, and biosynthesis of cellular components; developmental processes; hormonal regulation; and responses to stress. Spring. Staff (Biology).

134 CASE STUDIES IN STRUCTURAL MOLECULAR BIOLOGY (3).
Prerequisite, Chemistry 130 or equivalent. Principles of macromolecular structure and function with emphasis on proteins, molecular assemblies, enzyme mechanisms, and ATP enzymeology. Spring. Carter.

142 BIOCHEMICAL TOXICOLOGY (Toxicology 142) (3).
Prerequisites, Chemistry 130 or equivalent, and one additional biochemistry course (or permission of course director). Biochemical actions of toxins, and assessment of cellular damage by biochemical measurements. Course intended primarily for graduate students. Spring. Harper (course director).

144 MACROMOLECULAR THERMODYNAMICS (1).
Prerequisites, Chemistry 130 and two semesters of physical chemistry or permission of instructor. Basic molecular models and their use in developing statistical descriptions of macromolecular function. Fall. Lentz.

145 MACROMOLECULAR STRUCTURE AND DYNAMICS (1).
Prerequisites, Chemistry 130 and two semesters of physical chemistry or permission of instructor. Macromolecules as viewed with modern computational methods. Fall. Sosek (course director), Temple, Lentz.

146 MACROMOLECULAR EQUILIBRIA (1).
Prerequisites, Chemistry 130 and two semesters of physical chemistry or permission of the instructor. Stability of macromolecules and their complexes with other molecules. Fall. Hermans.

147 MACROMOLECULAR SPECTROSCOPY (1).
Prerequisites, Chemistry 130 and two semesters of physical chemistry or permission of the instructor. Principles of UV, IR, Raman, fluorescence, and spin resonance spectroscopy; applications to the study of macromolecules and membranes. Spring. Lentz.

150a INTRODUCTION TO LIGHT MICROSCOPY (Biology 175) (1).
Prerequisites, Biochemistry 144-147 or permission of course director. Fundamentals of optics and light microscope design for the novice student. Spring (even years). Salmon (course director).

150b ADVANCED TOPICS IN IMAGING (Biology 175, Cell Biology) (2).
Prerequisites, Biochemistry 144-147 or permission of course director. Optical imaging including fluorescence and confocal techniques. Scanning and transmission electron microscopy and image interpretation. Mechanical imaging and scanning probe microscopy. Spring (even years). Costello (course director), E. Jacobson, Salmon, Superfine.

151 MACROMOLECULAR INTERACTIONS (Chemistry 235) (1).
Prerequisites, Biochemistry 144-147 or permission of course director. Theory and practice of biophysical methods used in the study of interactions between macromolecules and their ligands including surface plasmon resonance, analytical ultracentrifugation, and calorimetry. Spring. Pielak (course director), Tripathy.

152 MACROMOLECULAR NMR THEORY (Chemistry 234) (1).
Prerequisite, Biochemistry 147 or permission of the course director. This is the lecture component of a combined lecture/laboratory course that provides a practical introduction to the use of macromolecular NMR spectroscopy. The lecture may be taken independently of the lab (BIOC 152L). Spring. Campbell (course director), Pielak, Young.

152L MACROMOLECULAR NMR PRACTICE (Chemistry 234) (1).
Prerequisite, Biochemistry 147 or permission of course director. Lab section for BIOC 152. Spring. Campbell (course director), Pielak, Young.

153 X-RAY CRYSTALLOGRAPHY OF MACROMOLECULES (Chemistry 233) (1).
Prerequisite, Biochemistry 144 or permission of course director. Principles of protein crystallography; characterization of crystals; theory of diffraction; phasing of macromolecular crystals and structure refinement. Fall. Ke.

154 PRINCIPLES OF AND SIMULATION OF MACROMOLECULAR DYNAMICS (1).
Prerequisites, Biochemistry 144-147 or permission of instructor. A combined lecture/computer lab treatment of the principles of macromolecular dynamics and structure as approached using the tools of molecular dynamics simulations. Spring (odd years). Hermans (course director), Trocha.
155 ELECTRICAL SIGNALS FROM MACROMOLECULAR ASSEMBLAGES (Neurobiology 222A) (2). Prerequisite: Biochemistry 147 or permission of course director. An intensive, six-hour-per-week introduction to the fundamentals of ion channel biophysics, including laboratory sessions to demonstrate principles and methods. Fall. Oxford (course director); Cheney, Rosenberg, Pallotta, Stuart.

156 BIOMOLECULAR INFORMATICS (1). Prerequisites: Biochemistry 144-147 or permission of instructor. A combined workshop/distance learning course introducing the methods and principles of biological data management as this relates to macromolecular sequence analysis. Spring. Vaisman.

157 MACROMOLECULAR CRYSTALLOGRAPHIC METHODS (Chemistry 223) (2). Prerequisite: Biochemistry 153 or permission of course director. A combined lecture/laboratory workshop for serious students of protein crystallography. Spring (odd years). Collins (course director). Redinbo, Carter, Sundek.

189 MOLECULAR BIOLOGY TECHNIQUES (BIOL 189, GNET 189, MCRO 189, PHCO 189, PHYI 189) (4). Prerequisites, some molecular biology, permission of the instructor. These one- and two-week intensive courses are part of the series of Carolina Workshops. Topics emphasized vary, but usually include techniques such as isolation of nucleic acids, blotting, cloning in viruses and plasmids, and DNA sequencing. Fall, spring, and summer courses available. Litaker and staff. Fee required. Eight laboratory hours.

Courses for Graduates

205 RESEARCH TOPICS IN BIOCHEMISTRY (3). Prerequisites, Chemistry 130 or equivalent and permission of the coordinator. Seminar and critical study of modern research topics in biochemistry under the supervision of individual biochemistry faculty. Spring. Caplow (coordinator); staff.

206 EXPERIMENTAL APPROACHES TO BIOCHEMICAL RESEARCH (1). A survey of biochemical techniques in a lecture/demonstration format. Fall. Staff.

207 ADVANCED BIOCHEMISTRY LABORATORY (2 or 4). Prerequisite, Chemistry 130 or equivalent. Permission of the department required except for departmental majors. Designed to introduce the student to research methods. Minor investigative problems are conducted with advice and guidance of the staff. May be repeated two or more semesters for credit. Hours and credit to be arranged, any semester. Staff.

208 ADVANCED BIOPHYSICS LABORATORY (2 or 4). Permission of the program required. Designed to introduce students in the Molecular and Cellular Biophysics Program to research methods. Minor investigative projects are conducted with advice and guidance of the staff. May be repeated two or more semesters for credit. Hours and credit to be arranged, any semester. Staff.

211 RESEARCH CONCEPTS IN BIOCHEMISTRY (2). Prerequisite, master's candidate in biochemistry and biophysics. A series of lectures and exercises on formulating a research plan to attack a specific scientific problem, and on presenting the research plan in the form of a grant proposal. Fall. G. Sancar (course director), staff.

212 SCIENTIFIC WRITING (3). Prerequisite, doctoral candidate in biochemistry and biophysics. A course of lectures and workshops on the principles of clear scientific exposition with emphasis on the design and preparation of research grants. Fall. G. Sancar (course director), staff.

222A CELLULAR AND MOLECULAR NEUROBIOLOGY: ELECTRICAL SIGNALING (Neurobiology 222A) (2). Prerequisite, permission of instructor. Considers the genesis of electrical impulses in the nervous system with emphasis on membrane potentials, voltage-gated ion channels, and structural features of neurons that influence coding. Course meets for five weeks with six lecture hours per week. Fall. Neurobiology faculty, including Morell.

222B CELLULAR AND MOLECULAR NEUROBIOLOGY: POSTSYNAPTIC MECHANISMS-RECEPTORS (Neurobiology 222B) (2). Prerequisite, permission of instructor. Consideration of membrane receptor molecules activated by neurotransmitters in the nervous system with emphasis on ligand binding behavior and molecular and functional properties of different classes of receptors. Course meets for four weeks with six lecture hours per week. Fall. Neurobiology faculty, including Morell.

222C CELLULAR AND MOLECULAR NEUROBIOLOGY: PRESYNAPTIC MECHANISMS (Neurobiology 222C) (2). Prerequisite, permission of instructor. Examination of molecules involved in synapse formation and the regulation of synaptic transmission. Course meets for five weeks with six lecture hours per week. Fall. Neurobiology faculty, including Morell.

223A CELLULAR AND MOLECULAR NEUROBIOLOGY: POSTSYNAPTIC MECHANISMS-INTRACELLULAR SIGNALING (Neurobiology 223A) (3). Prerequisite, permission of the instructor. Explores biochemical signal transduction events following activation of neurotransmitter receptors including G-protein coupling, desensitization, signaling specificity, downstream effectors, calcium signaling and tyrosine kinases. Course meets for five weeks with six lecture hours per week. Spring. Neurobiology faculty, including Morell.

223B CELLULAR AND MOLECULAR NEUROBIOLOGY: DEVELOPMENTAL NEUROBIOLOGY (Neurobiology 223B) (2). Prerequisite, permission of instructor. The molecular and cellular basis for development of neurons and networks. Topics include the basic CNS embryogenesis, molecular basis of neurite extension and pathfinding, specification of cell fate, and synaptogenesis. Course meets for five weeks with six lecture hours per week. Spring. Neurobiology faculty, including Morell.

The following seminar courses are designed for students majoring or minor ing in biochemistry who wish to further their knowledge in particular areas. Unless otherwise stated, two semesters of biochemistry are prerequisites for seminar courses. Most of these courses are given in alternate years by interested staff members. Unless otherwise stated, these seminars may not be repeated for credit. See the university catalog for credit, which is required for a graduate degree in Chemistry and Biochemistry. In addition, the courses provide experience in giving a critical review of the current literature.

235 SEMINAR IN CHEMICAL NEUROBIOLOGY (Neurobiology 235) (2). Prerequisites, two semesters of biochemistry. Fall. (2003 and alternate years.) Morell.

241 SEMINAR ON SPECIAL TOPICS IN BIOCHEMICAL RESEARCH (2). Prerequisites, two semesters of biochemistry. Covers currently active and productive areas of biochemical research. Specific subjects will be announced. May be repeated for credit. (Either semester as announced.) Staff.

244 SEMINAR IN THE PHASE PROBLEM IN X-RAY CRYSTALLOGRAPHY (2). Prerequisite, permission of instructor. Image formation is treated from a quite general point of view, drawing from Fourier transform methods used in X-ray crystallography. Homomorphic replacement, multiple wavelength anomalous scattering, and Bayesian direct methods are covered. One two-hour seminar a week. Spring. (2003 and alternate years.) Carter.

245 SEMINAR ON CELL SIGNALING (2). Prerequisite, two semesters of biochemistry. Signal transduction in embryonic development. Spring. (2003 and alternate years.) Maness.

251 SEMINAR IN DNA-PROTEIN INTERACTIONS (2). Prerequisites, two semesters of biochemistry. Review of current literature on structural, thermodynamic, and kinetic aspects of binding to DNA of proteins involved in replication, recombination, and repair. Spring. (2003 and alternate years.) A. Sancar.

254 SEMINAR IN CELLULAR RESPONSES TO DNA DAMAGE (2). Prerequisites, graduate-level courses (one each) in molecular biology and biochemistry. A seminar course on the enzymology of DNA repair and damage tolerance and the regulation of genes involved in these processes. Both classical and recent literature are discussed. Spring. G. Sancar.
260 SEMINARS IN BIOPHYSICS (2). Prerequisite, permission of the instructor. Students present seminars coordinated with the visiting lecturer series of the Program in Molecular and Cellular Biophysics. Fall and spring. Lent; staff.

273 MOLECULAR MODELING (Medicinal Chemistry 275) (3). Prerequisites, Mathematics 31, 32; Chemistry 181. Introduction to computer-assisted molecular design, techniques, and theory with an emphasis on the practical use of molecular mechanics and quantum mechanics programs. Fall. Trophsa (Coordinator).

275 GENETICS SYSTEMS (Biology 275, Genetics 275, Microbiology 275) (1). A course to provide public lecture experience to advanced genetics students. Students present personal research seminars based on their individual dissertation projects. Lectures are privately critiqued by fellow students and genetics faculty. Required for all candidates for the degree in Genetics. Fall, spring. Staff.

276 MACROMOLECULAR MODELING (Medicinal Chemistry 276) (3). Prerequisites, Chemistry 130 or equivalent and permission of instructor. Applications of computational techniques to the study of macromolecular systems (protein and nucleic acid structure, molecular dynamics, free energy simulations, ligand docking). Practical use of macromolecular modeling programs in the laboratory. Two to three lecture hours and three laboratory hours per week. Spring. Trophsa (Coordinator), staff.

301, 302 RESEARCH IN BIOCHEMISTRY (3 or more). Prerequisite, permission of department. Six or more hours a week throughout both semesters. (On demand.) Staff.

310 RESEARCH IN NEUROBIOLOGY (Neurobiology 310, Pathology 310, Pharmacology 310, Physiology 310, Biology 310, Psychology 310) (3-12). Prerequisite, permission of the graduate student adviser, curriculum in Neurobiology. Research in various aspects of neurobiology. Six to twenty-four hours a week. Fall and spring. Faculty of the Neurobiology program.

393 MASTER'S THESIS (Var.). Staff.

394 DOCTORAL DISSERTATION (Var.). Staff.

**DEPARTMENT OF BIOLOGY**

ALAN FEDUCCIA, Chair

*With recommendation of the department and the approval of the administrative board of the Graduate School, special courses and the direction of graduate studies are offered by the staff of the Institute of Marine Sciences, Morehead City, North Carolina.*

**Professors**

Albert S. Baldwin (81) Immunoglobulin Gene Expression
Kerry S. Bloom (39) Molecular Genetics
W. E. Bollenbacher (38) Invertebrate Neuroendocrinology
Jeffrey L. Dangl (87) Genetic and Molecular Analysis of Disease Resistance
J. Alan Feduccia (3) Vertebrate Evolution and Paleontology
Patricia G. Gensel (45) Paleobotany and Morphology
Lawrence I. Gilbert (37) Developmental Insect Physiology, Neuroendocrinology, and Biochemistry
Albert K. Harris (5) Morphogenesis and Embryology
Alan M. Jones (71) Plant Molecular and Cellular Biology
William M. Kier (67) Functional Morphology of Invertebrates, Biomechanics
Joel G. Kingsolver (101) Evolutionary Ecology and Physiological Ecology
William F. Marzluff (86) Transcriptional and Posttranscriptional Regulation of RNA Metabolism, Cell Cycle Regulation during Development
Ann G. Mathyse (52) Molecular Biology and Plant Pathology
Steven L. Martin (63) Molecular Biology and Biochemistry
Clifford R. Parks (56) Plant Systematics and Genetics
Robert K. Peck (57) Plant Ecology
Charles H. Peterson, Marine Ecology

Thomas D. Peters (77) Yeast Genetics
John R. Pringle (84) Cell Biology and Yeast Genetics
Edward D. Salmon (34) Cell Biology
Darrel W. Stafford (17) Developmental Biochemistry
Alan E. Siren (18) Population and Community Ecology
Peter S. White (72) Plant Ecology
R. Haven Wiley (20) Animal Behavior

**Associate Professors**

Victoria L. Bautch (79) Molecular Basis of Development
Kenneth J. Lohmann (83) Neuroendocrinology and Invertebrate Zoology
Gustavo P. Monson (33) Molecular Genetics of Drosophila
Donald W. Misch (12) Cell Biology and Electron Microscopy
Mark A. Peifer (85) Developmental Genetics
David Pfennig (91) Behavioral Ecology and Evolutionary Biology
Patricia J. Pulkka (35) Molecular Genetics
Jason W. Reed (88) Light Signal Transduction in Plants
Seth R. Reise (14) Community Ecology, Stream Ecology
Lilie L. Seals (68) Molecular Biology

**Assistant Professors**

Shawn C. Ahmed (102) Telomeres, DNA Change and Germline Immortality
Gregory P. Copenhaver (103) Plant Genome Biology, Recombination, Centromeres
Robert Duronio (92) Cell Cycle Control during Drosophila Development
Robert P. Goldstein (96) Generation of Cell Diversity in Development
Joseph J. Kiefer (97) Plant Cell Biology
Robert D. Podolsky (94) Ecology and Evolution
Jeff Schelbody (95) Mitotic Recombination, DNA Repair
Todd J. Vision (104) Evolutionary and Computational Genetics

**Associated Faculty**

Stephen T. Crews (98) Molecular Genetics
Frank L. Conlon (100) Xenopus, Mesoderm, Heart, Thyroid Genes
Brian K. Kay (65) Molecular Recognition
Wayne W. Litaker, Molecular Biology
Rogers McLaugh (54) Plant Systematics
Michael A. Reznick, Molecular Genetics
Carly Winterberger, Reproductive and Developmental Toxicology
R. E. Wyatt (99) Ecological Evolution, Plant Reproduction

**Professors Emeriti**

Edward G. Barry
C. Richie Bell
Aristotle J. Dominas
Nelson G. Hairston
Max H. Hommersand
William J. Koch
H. Eugene Lehman
Jimmy R. Massey
Elizabeth A. McMahon
Helmut C. Mueller
Albert E. Radford
Tom K. Scott

The Department of Biology offers programs of study leading to degrees of Master of Arts, Master of Science, and Doctor of Philosophy in Biology. The curricula are designed primarily for students who plan to continue for the doctoral degree. A master's degree may be taken as part of the program leading to the Ph.D.; however, a master's degree is not an essential part of doctoral programs. Special departmental rules and guidelines for advanced degrees are available upon request.
Graduate Programs and Facilities

The Department of Biology is housed in three modern buildings and is equipped with modern instrumentation for research and research training in the biological disciplines represented by faculty areas for research. These include:

**Genetics and Molecular Biology**, including (1) biochemistry and molecular biology (with emphasis on development, protein synthesis, enzyme mechanisms and control, and aspects of plant systems); (2) developmental and molecular genetics.

**Cell Biology, Development, and Physiology**, including (1) cytology and cell biology (with emphasis on mitotic mechanisms, histochemistry, and ultrastructure); (2) developmental biology (with emphasis on invertebrate endocrinology, experimental morphogenesis, morphogenetic movements, tissue culture, hormones, and plant development); (3) physiology (with emphasis on functional morphology, biomechanics and neuroethology, and developmental and membrane functions in plant systems).

**Systematic and Evolutionary Biology**, including neontological and paleontological studies of invertebrates, vertebrates, and vascular plants emphasizing morphology, anatomy, paleontology, and systematics.

**Ecology and Behavior, and Organismic Biology**, including (1) ecology and population biology (life histories, population, community, and ecosystem phenomena in terrestrial, freshwater, and marine ecosystems); (2) behavior (with emphasis on social and mating systems of vertebrates, communication, ecology and ontogeny of behavior, and predator-prey interactions); (3) marine biology (with emphasis on marine ecology and oceanography); (4) comparative physiology, neuroethology, biomechanics.

Students in marine biology, after completing required course work in the department, have access to the research facilities of the Institute of Marine Sciences, Morehead City, North Carolina. By cooperative arrangements, deep water research can be carried out through the use of the research vessel of the Duke University Marine Laboratory.

Interdepartmental degree programs in genetics, ecology, neurobiology, and marine science offer unusual opportunities for special training through participation of staff from the Department of Biology and many other departments in arts and sciences and health affairs.

The John N. Couch Biology Library has over seventy thousand volumes and receives over twelve hundred serials related to fields of research in the department. The collection includes treatises, monographs, symposium volumes, reprints, and standard and classical works of research and historical importance. The nearby Health Sciences Library contains additional biological references.

A major research asset is the location of the University, which makes the varied flora and fauna of the Appalachian Mountains, Piedmont Plateau, Coastal Plain, and Atlantic Coast all accessible for research and instruction. The department operates a small field station a few miles from the Chapel Hill campus in the Mason Farm Biological Reserve, which includes several hundred acres of upland and floodplain habitats.

The Coker Arboretum and the North Carolina Botanical Garden are of value to students in the study of special problems. The Herbarium, containing more than six hundred thousand specimens, is especially rich in collections of the vascular plants and fungi of the Carolinas and the Southeastern United States.

The Highlands Biological Station, administered for the University system by Western Carolina University, is located in the biologically rich mountains at Highlands, North Carolina. Graduate courses offered cover various parts of the mountain biota. Credit may be obtained through UNC-Chapel Hill or Western Carolina University. A limited amount of research support is available on a competitive basis. (See the annual announcement of the Highlands Biological Station.)

The University is a member of the Organization for Tropical Studies (O.T.S.). Financial support is available for students attending O.T.S. courses in tropical ecology in Costa Rica.

Additional information about the graduate program is available at www.unc.edu/depts/biology.

Fellowships and Assistantships

Application for admission and graduate appointments, accompanied by credentials and Graduate Record Examination scores, including the Advanced Biology score, should be submitted for receipt no later than December 31.

All outstanding prospective graduate students who apply for admission are automatically considered for University Fellowships.

More than forty-five teaching assistantships are open to graduate students. Duties of assistant include preparation for and supervision of laboratory and recitation sections of undergraduate courses. Duties usually require thirteen to fifteen hours per week including six contact hours in classes and six to nine hours of preparation or other services associated with instruction.

Research assistantships are available. Salaries and duties are variable as determined by the research needs of faculty supervising the work. Applications for these appointments must be made personally to faculty members directing grant-supported research.

The following awards are specifically for graduate students in the Biology Department:

- The Alma Holland Beers Scholarships are awarded annually to support summer research of students in botany. They are nonservice awards.
- The William Chambers Coker Fellowship is awarded annually to a student or students in the final year of study toward a Doctor of Philosophy in a botanical field. This is a nonservice award that carries with it an additional supplement for tuition and fees.
- The Mrs. W. C. Coker Fellowship is awarded annually to an outstanding first-year graduate student in plant biology. This is also a nonservice award that carries with it an additional supplement for tuition and fees.
- The H. V. Wilson Marine Scholarship is awarded annually for summer work at a marine laboratory. It is a nonservice award.

Courses for Graduates and Advanced Undergraduates

The stated prerequisites should be interpreted to read "or equivalent" and may be waived by the course instructor for students who are adequately prepared.

**101 STRUCTURE, FUNCTION, AND DEVELOPMENT OF PLANTS (4).** Prerequisite, Biology 52 or 53. A modern approach to growth, development, differentiation, and physiological processes in plants. Three lecture and three laboratory hours a week. Spring. Jones.

**103 INTRODUCTION TO PLANT TAXONOMY (4).** Prerequisite, Biology 41 and/or Biology 43 or permission of the instructor. Introduction to the taxonomy of vascular plants. Principles of classification, identification, nomenclature, and description. Laboratory and field emphasis on phytography, families, description, identification, and classification of vascular plant species. Three lecture and three laboratory hours a week. Fall. Staff.

**104 VERTEBRATE EMBRYOLOGY (3).** Prerequisite, Biology 45 or 52. Principles of development including gastrulation, cleavage, germ layer formation, organogenesis, and techniques of experimental analysis of developmental processes. Three lecture hours a week. Spring. Harris.
104L VERTEBRATE EMBRYOLOGY LABORATORY (1). Prerequisite or corequisite: Biology 104. Descriptive and experimental aspects of vertebrate development. Four to six laboratory hours a week. Spring. Harris.


108 MICROBIOLOGY (3). Prerequisite: Biology 50 or consent of instructor. Bacterial form, growth, physiology, genetics, and diversity. Bacterial interactions including symbiosis and pathogenesis (animal and plant). Use of bacteria in biotechnology. Brief introduction to fungi and viruses. Three lecture hours per week. Spring. Maruthy.

108L MICROBIOLOGY LABORATORY (2). Prerequisite or corequisite, Biology 108. Sterile technique, bacterial growth and physiology, bacterial genetics, bacteriophage, and bacterial diversity. Two laboratory hours per week. Fall. Maruthy.

109 BACTERIAL GENETICS (3). Prerequisites: for undergraduates, Biology 108; for graduate students, a molecular microbiology course. Genetics of eubacteria with emphasis on molecular genetics including regulation of gene expression, transposons, operons, repressors, plasmids, transformations and conjugation. Spring. Maruthy.

114 AVIAN BIOLOGY (3). Prerequisites, Biology 11, 11L and one additional course in biology. A study of avian evolution, biogeography, ecology, and behavior, with emphasis on North Carolina birds. Three lecture hours a week. Spring. Feduccia. Wiley.

114L AVIAN BIOLOGY LABORATORY (1). Corequisite, Biology 114. Techniques for the study of avian evolution, ecology, and behavior, with emphasis on North Carolina birds. Three laboratory or field hours a week, including one or two weekend field trips. Spring. Wiley.

115 STRATEGIES OF HOST-MICROBE INTERACTIONS (3). Prerequisites, Biology 52 and 108, or equivalents. There is great variety in how microbes colonize and live with their hosts. The course will summarize strategies of pathogenicity, symbiosis, commensalism, and mutualism. Evolutionary, cellular, and molecular aspects will be analyzed. Spring. (Alternate years.) Dang.

120 COMPARATIVE PHYSIOLOGY (3). Prerequisites, Biology 11, 11L. Physics 24 and 25. An examination of the physiology of animals using a comparative approach. Both invertebrate and vertebrate animals are discussed in order to elucidate general principles. Spring. Kier.

121 INTRODUCTION TO NEUROBIOLOGY (Neurobiology 125) (3). Prerequisite, Biology 50 and 52. Survey of neurobiological principles, including development, morphology, physiology, and molecular mechanisms in vertebrates and invertebrates. Three lecture hours a week. Spring. Bollenbacher.

122 HUMAN GENETICS (Genetics 122) (3). Prerequisite, Biology 50. Pedigree analysis, inheritance of complex traits. DNA damage and repair, human genome organization, DNA fingerprinting, the genes of hereditary diseases, chromosomal aberrations, cancer and oncogenes, immunogenetics, and tissue transplants. Three lecture hours a week. Fall. Maroni.

123 PATHOGENIC AND SYMBIOTIC INTERACTIONS OF PLANTS WITH MICROORGANISMS (3). Prerequisite, Biology 108 or equivalent. Pathogenic and symbiotic interactions of viruses, bacteria, and fungi with plants. Emphasis on molecular aspects. Fall. Maruthy.

124 INTRODUCTION TO IMMUNOLOGY (Microbiology 124) (3). Prerequisites, Biology 50, 52, and permission of instructor. This course provides a general overview of the evolution, organization, and function of the immune system. Instruction will be inquiry-based with extensive use of informational and instructional technology tools. Spring. Bollenbacher, Weintraub.

125 CLINICAL AND COUNSELING ASPECTS OF HUMAN GENETICS (Genetics 125) (3). Prerequisites, Biology 122 and permission of instructor. Topics in clinical genetics including pedigree analysis, counseling/ethical issues, genetic testing, screening, and issues in human research are taught in a small group format. Active student participation is expected. Three lecture hours per week. Spring. Roche.

126 OCEANOGRAPHY (Marine Sciences 101; Environmental Science 127; Geology 101) (3). Prerequisite, major in a natural science or at least two college-level courses in natural sciences. The origin of ocean basins, chemistry and dynamics of seawater, biological communities and processes, the sedimentary record, and the history of oceanography. Term paper. Intended for students with college science background; other students should see Geology 12. Three lecture hours a week. Fall. Neumann. Spring, staff (Marine Sciences).

129 LABORATORY IN CELL BIOLOGY (4). Prerequisites, grade of B- or better in Biology 52. Modern methods to study cells. Technical skills necessary for research in cell and molecular biology. Knowledge of good lab practice, operation of technical instrumentation. Three lecture and three laboratory hours per week. Spring. Jones.

130 INTRODUCTION TO BIOLOGICAL CHEMISTRY (Chemistry 130) (3). Prerequisites, Chemistry 62, 62L, Biology 11. The study of cellular processes including catalysis, metabolism, bioenergetics, and biochemical genetics. The structure and function of biological macromolecules involved in these processes are emphasized. Fall and spring. Biological Chemistry faculty.

131 ENDOCRINOLOGY (3). Prerequisite, Biology 52 or 62. Principles of neuroendocrine and endocrine systems of vertebrates and selected invertebrates with consideration of the anatomy and physiology of glands of internal secretion. Hormone chemistry and interendocrine relationships are also emphasized. Three lecture hours a week. Spring. Bollenbacher.

132 EVOLUTIONARY MECHANISMS (3). Prerequisite, Biology 50 and 54 or permission of the instructor. Introduction to mechanisms of evolutionary change, including natural selection, population genetics, life history evolution, speciation, and micro- and macro-evolutionary trends. Three lecture hours plus two hours of laboratory/research per week. Fall. Pfennig.

133 EVOLUTION AND DEVELOPMENT (3). Prerequisites, Biology 50, 52, 54. The course examines the mechanisms by which organisms are built and evolve. In particular, it examines how novel and complex traits and organisms arise from interactions among genes and cells. Three lecture hours per week. Fall. Pfennig, Goldstein.

134 BIOLOGY OF BLOOD DISEASES (Pathology 134) (3). Prerequisite, Biology 52 or permission of instructor. An introduction to the biology and pathophysiology of blood and the molecular mechanisms of some human diseases, including malignant neoplasms, anemias, hemophilies, thrombophilies, atherosclerosis, and viral infections. Fall. Church.

140 BIOLOGICAL OCEANOGRAPHY (Marine Sciences 104; Environmental Sciences 120) (4). Prerequisite, Biology 54 or 105 or permission. Physical, chemical, and biological factors characterizing estuarine and marine environments emphasizing factors controlling animal and plant populations including experimental approaches and methods of analysis, sampling, and identification. Five lecture and five laboratory hours a week. Summer, alternate years. (Offered on demand at the Institute of Marine Sciences. Morehead City, NC.) Staff.

141 SPECIAL PROBLEMS IN MARINE BIOLOGY (Marine Sciences 141) (3-6). Prerequisites, Biology 140 and permission of instructor. Survey of current problems and intellectual approaches in any of the following areas: marine microorganisms (Kohlmeyer, Pearl), marine ecology (Hay, Peterson), Marine Chemical Ecology (Hay, Lindquist). Hours and credits by prior agreement (with five or more laboratory and conference hours a week per unit credit). Fall, spring, first or second summer sessions. (Offered on demand at Morehead City, NC.) Staff of Institute of Marine Sciences.

142 PLANT ECOLOGY (4). Prerequisite, Biology 54. Terrestrial, vascular plant ecology including environmental physiology, population dynamics, and community structure. Laboratory stresses collection and interpretation of field data. Three lecture and two laboratory hours a week. Fall. (Alternate years.) Peet.
143 ECOLOGICAL PLANT GEOGRAPHY (Geography 143) (3). Prerequisite, Biology 11 or Geography 38. Major vegetation types of the world including their distribution, structure, and dynamics. The principle causes for the distribution of plant species and communities, such as climate, soils, and history are also discussed. Fall. (Alternate years.) Peet.

144 DEVELOPMENTAL BIOLOGY (3). Prerequisites, Biology 50, 52 and Chemistry 51. An experimental approach to an understanding of developmental processes and the molecular mechanisms that control cell growth and cell differentiation. Three lecture hours a week. Spring. Bauch, Peifer, Reed.

145 STATISTICAL ANALYSIS IN ECOLOGY AND EVOLUTION (3). Prerequisites, Biology 54, Statistics 11 or 31. Statistical analysis and modeling of data in ecology and evolutionary biology. Analyses are related directly to specific biological data and experiments, including student projects that involve applying techniques to data. Three lecture hours per week. Fall. Alternate years. Kingsolver.

146 MARINE ECOLOGY (Marine Sciences 146) (3). Prerequisite, Biology 54 or 105. A survey of ecological and oceanographic processes structuring marine communities in a broad range of habitats with an emphasis on experimental approaches to addressing both basic and applied problems in marine systems. Three lecture hours a week. Spring. (Alternate years.) Peterson.

147 FIELD ECOLOGY (4). Prerequisites, Biology 54 and one additional course in biology. Applications of ecological theory to terrestrial and/or freshwater systems. Lectures acquaint students with these systems and emphasize quantitative properties of interacting populations and communities within them. The required laboratory teaches techniques and methodology applicable for analysis of these systems. Individual and group projects emphasize experimental testing of ecological theory in the field. Two lecture and two lab hours a week. Spring. (Alternate years.) Reice, staff.

149 ECOSYSTEM STRUCTURE AND FUNCTION (3). Prerequisite, Biology 54 or a course in limnology or geochemistry. Pattern and process in natural ecosystems, with stress on comparative approaches to ecosystems analysis. Topics include primary and secondary productivity, nutrient cycling, and the biogeochemistry of aquatic and terrestrial ecosystems. Three lecture hours a week. (On occasion.) Staff.

149L ECOSYSTEM STRUCTURE AND FUNCTION LABORATORY (1). Corequisite, Biology 149 and permission of the instructor. Use of data to generate empirical models of ecosystem patterns or processes. Individual research projects. Three laboratory hours a week. Fall or spring. (On occasion.) Reice.

150 ANIMAL SOCIETIES AND COMMUNICATION (3). Prerequisite or corequisite, Biology 73. Comparative review of animal societies; diversity of social structure, social dynamics, communication, ecology, and evolution of social organization. Three lecture hours a week. Spring. (Alternate years.) Wiley.

151 BEHAVIORAL ECOLOGY (3). Prerequisite, Biology 54 or 73. Behavior as an adaptation to the environment. Evolution of behavioral strategies for survival and reproduction. Optimality, competition, and "games that animals play." Three lecture hours a week. Spring. (Alternate years.) Pfennig.

152 PLANT ANATOMY (3). Prerequisite, Biology 51. Introduction to the development and comparative anatomy of vascular plants. Practice in methods of anatomical microtechnique. Three lecture and four laboratory hours a week. Spring. Staff.

153 COMPARATIVE MORPHOLOGY OF VASCULAR PLANTS (5). Prerequisite, Biology 51. Comparative morphology and evolutionary relationships of the Tracheophyta. Both living and fossil forms are considered. Three lecture and four laboratory hours a week. Spring. (Alternate years.) Sengel.

154 BEHAVIORAL NEUROSCIENCE (3). Prerequisites, Biology 52 or permission of the instructor. The neurobiological basis of animal behavior at the level of cells, neural circuits, sensory systems, and organisms. Lecture topics range from principles of cellular neurobiology to ethological field studies. Spring. (Alternate years.) Lohmann.

155 COMPARATIVE BIOMECHANICS (3). Prerequisites, Biology 11, 111, Physics 24 and 25. The structure and function of organisms in relation to the principles of fluid mechanics and solid mechanics. Fall. (Alternate years.) Kier.

156 EVOLUTIONARY ECOLOGY (3). Prerequisite, Biology 132 or permission of instructor. Advanced topics in the evolution of form and function. May include issues in life-history evolution, evolutionary physiology, evolutionary morphology, and the evolution of complexity. Three lecture hours per week. Spring. (Alternate years.) Podolsky.

157 PROBLEMS IN VERTEBRATE EVOLUTION (Geol. 157) (3). Prerequisite, Biology 63 or permission of instructor. A study of the major transitions in vertebrate evolution and associated problems in evolutionary biology; structural change, paleoecology, biogeography and earth history, physiology, and behavior. Three lecture hours a week. (On occasion.) Reduccia.

160 DEVELOPMENTAL GENETICS (3). Prerequisites, Biology 50, 52, and permission of the instructor required of undergraduates. Genetic and molecular control of plant and animal development. Extensive reading from primary literature. Fall. Bauch, Reed.

161 PRINCIPLES OF GENETIC ANALYSIS I (Genetics 112) (3). Prerequisite for undergraduates. Biology 50; for graduate students, an undergraduate genetics course or permission of instructor. Genetic principles of genetic analysis in prokaryotes and lower eukaryotes. Spring. Peters, Pringle.

162 COMPUTATIONAL GENETICS (4). Prerequisites, Biology 50, Computer Science 14, Statistics 31. A study of the concepts underlying the bioinformatic tools used in genetics. Topics include alignment, gene finding, expression analysis, mapping, phylogenetics, and measuring sequence divergence and polymorphism. Three lecture and two laboratory hours per week. Fall. Vision.

163 LABORATORY EXPERIMENTS IN GENETICS (4). Prerequisite, Biology 50. Experiments using a range of organisms from bacteria to Drosophila, higher plants, and man to sample organismal and molecular genetics. One lecture hour and four laboratory hours a week. Fall or spring. Staff.

164 MOLECULAR BIOLOGY (3). Prerequisites or corequisites, Chemistry 61 and Biology 50. Emphasis is on prokaryotic molecular biology, plasmids, l-phage, and single-strand phages. Three lecture hours a week. Spring. Searles, Stafford.

165 INTRODUCTION TO SIGNAL TRANSDUCTION (3). Prerequisites, Biology 11, 50, 52. This course presents an introduction to signal transduction pathways used by higher eukaryotes. Several signaling paradigms will be discussed to illustrate the ways that cells transmit information. Three lecture hours per week. Fall. Kiefer.

166 UNSOLVED PROBLEMS IN CELLULAR BIOLOGY (3). Prerequisite, Biology 52. A survey of areas of current interest in cytology, embryology, and genetics with concentration on problems that remain unsolved but appear to be near solution. Three lecture and discussion hours a week. Fall. Harris, Pukkila.

167 ADVANCED CELL BIOLOGY (3). Prerequisite, Biology 52. An advanced course in cell biology with emphasis on the biochemistry and molecular biology of cell structure and function. Three lecture hours a week. Fall. Staff.


169 CANCER BIOLOGY (3). Prerequisites, Biology 50, 52. Selected examples will be used to illustrate how basic research allows us to understand the mechanistic basis of cancer and how these insights offer hope for new treatments. Three lecture hours per week. Spring. Duronio, Peifer.

171 MOLECULAR BIOLOGY TECHNIQUES (4). Prerequisite, permission of instructor; Biology 164 recommended. Experiments with bacterial phage, nucleic acid isolation and properties, recombinant DNA techniques and DNA sequencing. Additional hours in laboratory are necessary to complete assignments. Fall. Stafford.
175 SPECIAL TOPICS (3). Prerequisite, permission of the instructor. Content will vary. Three lecture and discussion hours a week by visiting or resident faculty. Fall, spring. Staff.

177 CURRENT TOPICS IN CELL DIVISION (3). Prerequisite, Biology 52. An advanced course in cell and molecular biology integrating genetic, biochemical, and structural aspects of the cell cycle. Principles derived from a variety of biological systems. Extensive reading of classic papers as well as recent literature. Spring. Bloom, Salmon.

178 ADVANCED MOLECULAR BIOLOGY I (Biochemistry 110; Genetics 110; Microbiology 108; Pharmacy 136) (3). Prerequisites, at least one undergraduate course in biochemistry and genetics. DNA structure, function, and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, and repair and genome fluidity. Undergraduate students should obtain permission of the instructor before registering. Three lecture hours per week. Fall. Griffith, Mascon, Sancar.

179 ADVANCED MOLECULAR BIOLOGY II (Biochemistry 111; Genetics 111; Microbiology 109; Pharmacology 137) (3). Prerequisites, at least one undergraduate course in both biochemistry and genetics. RNA structure, function, and processing in biological systems, including transcription, gene regulation, translation, and oncogenes. Three lecture hours per week. Spring. Baldwin, Fried, Koch.

181 PALEOBOTANY (Geology 197) (4). Prerequisites, Biology 111-111, and permission of the instructor. An introduction to the morphology, stratigraphic occurrence, and evolutionary relationships of fossil plants. Both macrofossils and microfossils are considered. Three lecture and three laboratory hours a week. Fall. (Alternate years.) Gensel.

184 CONSERVATION BIOLOGY (3). Prerequisite, Biology 54. The application of biological science to the conservation of populations, communities, and ecosystems, including rare species management, exotic species invasions, management of natural disturbance, research strategies, and preserve design principles. Three lecture hours a week. (On occasion.) White.

185 POPULATION ECOLOGY (3). Prerequisite, Biology 54. An advanced treatment of topics in animal population and community ecology, stressing analytical and interpretative approaches. Topics vary from year to year and the course may be repeated for credit. Three lecture and discussion hours a week. Spring. (Alternate years.) Staff.

185L LABORATORY IN POPULATION ECOLOGY (1). Corequisites, Biology 185 and permission of instructor. Methodology in the analysis and interpretation of population and community phenomena. Three laboratory and field hours a week. Spring. (Alternate years.) Staff.

186 COMMUNITY AND SYSTEMS ECOLOGY (3). Prerequisite, Biology 54. A holistic approach to ecology. State-space modeling of ecological processes. Other topics vary but may include spatial and temporal heterogeneity in communities and ecosystems; disturbance theory; decomposition; community structure and function; and freshwater ecology. Spring. Reice.

186L COMMUNITY AND SYSTEMS ECOLOGY LABORATORY (1). Prerequisite or corequisite, Biology 186. Community and/or ecosystem modeling and computer simulation. Experimental analyses and validation in the field. Individual and group projects. Three laboratory and field hours a week. Spring. Reice.

188 LIGHT MICROSCOPY FOR THE BIOLOGICAL SCIENCES (3). Prerequisites, Biology 52 and permission of instructor. Introduction to various types of light microscopy, digital and video imaging techniques and their application in biological sciences. Spring. Salmon.

189 MOLECULAR BIOLOGY TECHNIQUES (Biochemistry 189; Genetics 189; Microbiology 189; Pharmacology 189; Physiology 189) (4). Prerequisites, some molecular biology permission of the instructor. These one- and two-week intensive courses are part of the series of Carolina Workshops. Topics emphasized vary but usually include techniques such as isolation of nucleic acids, blotting, cloning in viruses and plasmids, and DNA sequencing. Fall, spring, and summer courses available. Fee required. Eight laboratory hours. Littaker and staff.

190 FRONTIERS IN BIOIMMUNOLOGICAL SCIENCE (3). Prerequisites, two courses in biology and permission of the instructor. Does not count toward a major in biology. Fall. (Available by correspondence.)

195 FIELD BIOLOGY AT HIGHLANDS BIOLOGICAL STATION (1-4). Prerequisite, Biology 111 or equivalent or permission of the instructor. Content varies. Summer field biology at the Highlands Biological Station focuses generally on the special fauna and floristic processes and patterns characteristic of the southern Appalachian mountain region. Five lecture and three to five laboratory and field hours per week depending on credit. Summer. Staff.

With approval of the instructor and the Graduate School, biology majors who need fewer than fifteen hours to complete the bachelor's degree and who have at least a B average in biology courses may take one or two courses at the 200 level for the purpose of later receiving graduate credit.

Courses for Graduates

213 ADVANCED MARINE ECOLOGY (3). Prerequisites, Biology 109 or 146, and special permission of the instructor. A study of the organisms of coastal waters in relation to their physical, chemical, and biotic environments. Six lecture, seminar, or laboratory hours a week, and one or more field trips to the coast. Spring. Staff of the Institute of Marine Sciences.

215 MARINE MYCOLOGY (MASC 215) (6). Prerequisite, Biology 115. Structure, development, systematics, and ecology of marine fungi. Seven and one-half lecture and fifteen laboratory or field hours a week. Summers, given on demand at the Institute of Marine Sciences, Morehead City. Kohlmeyer.

225 EXPERIMENTAL NEUROPHYSIOLOGY (Neurobiology 225) (3). Prerequisite, permission of the instructor. Six or more laboratory hours a week. (On occasion.) Staff (Neurobiology).

231 PRINCIPLES OF ANGIOSPERM SYSTEMATICS AND PHYLOGENY (3). Prerequisite, Biology 103. A survey of the history, literature, and basic principles of systematics including revisionary studies and the phylogeny and classification of flowering plants. Spring. (Alternate years.)

231L PRINCIPLES OF ANGIOSPERM SYSTEMATICS AND PHYLOGENY LABORATORY (2). Prerequisite, Biology 103. Application of various types of evidence relating to the description, classification, and nomenclature of selected groups of phylogenetic significance. Individual and group term projects required. Spring. (Alternate years.)

233 PHYLOGENY AND CLASSIFICATION OF FLOWERING PLANTS (3). Prerequisite, Biology 112. Comparative study of modern systems of classification based upon morphological and phylogenetic considerations. Three lecture or report hours a week. Spring. (Alternate years.)

247 FIELD PLANT GEOGRAPHY (2). Prerequisites, Biology 142 or 143 and permission of instructor. Intensive literature and field study of the plant geography and ecology of a selected region. Weekly seminar-style discussion followed by approximately nine days' field experience. May be repeated for credit. Spring. (Alternate years.) Peet.

250 SPECIAL SEMINAR (2). Prerequisite, permission of the instructor. Consideration of special topics in biology. May be repeated for credit. Fall or spring (as occasion demands). Staff.

251 GRADUATE SEMINAR IN BIOLOGY (2). Prerequisite, graduate standing or permission of instructor. A course to provide public lecture experience to advanced biology students. Students present individual research seminars based upon their dissertation projects. Lectures are critiqued by fellow students and biology faculty. Required of all candidates for the degree in biology. Fall and spring. Staff.
252 SEMINAR IN INSECT PHYSIOLOGY, BIOCHEMISTRY, AND ENDOCRINOLOGY (2). Prerequisite, permission of the instructor. May be repeated for credit. Current topics and discussion in insect physiology, biochemistry, and endocrinology. Fall and spring. Bollenbacher, Gilbert.

253 SEMINAR IN EMBRYOLOGY (2). Prerequisite, Biology 52 or permission of the instructor. May be repeated for credit. Fall or spring. Bautch, Harris.

254 SEMINAR IN CELL BIOLOGY (2). Prerequisite, Biology 52 or permission of the instructor. May be repeated for credit. Fall or spring. Bloom, Goldstein, Harris, Salmon.

255 SEMINAR IN ECOLOGY (2). Prerequisite, Biology 54 or permission of the instructor. May be repeated for credit. Fall and spring. Peet, Reice, White.

256 SEMINAR IN INVERTEBRATE ZOOLOGY (2). Prerequisite, Biology 105 or permission of the instructor. May be repeated for credit. Fall or spring. Kier, Lohmann, Podolsky.

257 SEMINAR IN VERTEBRATE EVOLUTIONARY BIOLOGY (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall or spring. Feduccia.

258 SEMINAR IN EVOLUTIONARY BIOLOGY (2). Prerequisite, Biology 132 or permission of instructor. Advanced topics in evolutionary biology. Spring. Kingsolver, Pfenning, Podolsky.

259 SEMINAR IN COMPARATIVE ANIMAL BEHAVIOR (Neurobiology 259) (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall or spring. Lohmann, Wiley.

260 SEMINAR IN COMPARATIVE PHYSIOLOGY (Neurobiology 260) (2). Prerequisite, Biology 120 or permission of the instructor. Fall or spring. Lohmann.

264 SEMINAR IN MOLECULAR BIOLOGY (2). Prerequisite, Biology 50 or permission of the instructor. May be repeated for credit. Fall or spring. Bautch, Bloom, Stafford.

265 SEMINAR IN MARINE BIOLOGY (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall or spring. Kier, Podolsky.

266 SEMINAR IN NEUROPHYSIOLOGY (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall or spring. Lohmann, staff of Neurobiology Curriculum.

267 SEMINAR IN PLANT PHYSIOLOGY (2). Prerequisite, permission of the instructor or research director. Fall and spring. Marthysse.

268 SEMINAR IN CELL BIOLOGY AND BIOCHEMISTRY (2). Prerequisite, permission of instructor or research director. Fall and spring. Gilbert.

269 SEMINAR IN PLANT SYSTEMATICS (2). Prerequisite, permission of instructor or research director. Fall and spring. Gilbert.

270 SEMINAR IN GENETICS (Genetics 270) (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall and spring. Bautch, Maron, Peters, Peifer, Pulkitla, Searles, Sekelsky.

271 SEMINAR IN PLANT MORPHOLOGY AND ANATOMY (2). Prerequisite, permission of research director. Fall and spring. Gesell.

272 SEMINAR IN PLANT MOLECULAR AND CELL BIOLOGY (2). Prerequisite, permission of the instructor. May be repeated for credit. Current and significant problems in plant molecular and cell biology are discussed in a seminar format. Fall or spring. Dangl, Jones, Kiefer.

275 GENETICS SYSTEMS (Genetics 275, Microbiology 275, Biochemistry 275) (1). A course to provide public lecture experience to advanced genetics students. Students present personal research seminars based on their individual dissertation projects. Lectures are privately critiqued by fellow students and genetics faculty. Required of all candidates for the degree in genetics. Fall and spring. Genetics faculty.

282 PALYNOLOGY (5). Prerequisite, consent of the instructor. A consideration of various aspects of palynology, including the morphology, structure, development, systematics, evolution, preparation techniques, and analysis of living and fossil pollen grains, spores, and other palynomorphs. Two lecture and six laboratory hours a week. Fall or spring. (Alternate years.) Gettel.

290 SEMINAR IN NEUROBIOLOGY (Biochemistry, Neurobiology, Pathology, Pharmacology, and Physiology 290) (3). Prerequisite, permission of the director of the Neurobiology Curriculum. An intensive consideration of selected topics and problems in neurobiology. The course focuses on the development and evaluation skills of the trainees. Six credit hours required for neurobiology graduates. Spring. Faculty of the Neurobiology Curriculum.

295 RESEARCH CONCEPTS (Microbiology 295) (2). No prerequisite. Course is designed to provide skills associated with being a scientist. Areas of focus: (1) productive lines of investigation, (2) experiment design, (3) protocol evaluation, (4) proposal writing, and (5) data presentation. Fall or spring. Bloom, Jones, Edgell, Griffin, Carter.

299 INTRODUCTION TO GRADUATE RESEARCH (Var.). Graduate research for six weeks in two laboratories. Designed primarily to acquaint first-year students with research techniques and to assess their propensity for research. Arranged by mutual agreement of students and faculty members during fall orientation. May be repeated once for credit. Six to nine hours per week. Fall and spring. Staff.

Courses numbered 300 and above are designed for applicants for advanced degrees. Each course requires permission of the instructor or research director. Each may be repeated for two or more semesters for credit.

300 RESEARCH IN CYTOLOGY AND CELL BIOLOGY (2 or more). Bollenbacher, Conlon, Gilbert, Goldstein, Harris, Mish, Salmon.

301 RESEARCH IN ECOLOGY (2 or more). Kingsolver, Peet, Reice, Stiven, White, Wiley.

302 RESEARCH IN NEUROBIOLOGY (Neurobiology 310; Biochemistry, Pathology, Pharmacology, and Physiology 310) (2 or more). Bollenbacher, Gilbert, Wiley, and faculty of the Neurobiology Curriculum.

303 RESEARCH IN ETHOLOGY AND ANIMAL BEHAVIOR (2 or more). Kier, Lohmann, Wiley.

304 RESEARCH IN EMBRYOLOGY (2 or more). Bautch, Gilbert, Harris, Peifer.

305 RESEARCH IN GENETICS (Genetics 305) (2 or more). Ahmed, Bautch, Duronio, Goldstein, Maroni, Marthysse, Mann, Peters, Pulkitla, Searles, Sekelsky.

306 RESEARCH IN MARINE SCIENCES (Marine Sciences curriculum 300) (2 or more). Kier, Lohmann.

307 RESEARCH IN MARINE SCIENCES ON MOLLUSCA, CRUSTACEA, Ichthyology, OR OCEANOGRAPHY (at the Institute for Marine Science, Morehead City) (2 or more). Approval by the Department of Biology required. Chestnut, Fahy, Peterson, Schwartz.

308 RESEARCH IN MOLECULAR BIOLOGY (2 or more). Bloom, Bautch, Duronio, Gilbert, Searles, Stafford.

309 RESEARCH IN PHYSIOLOGY: CELLULAR, COMPARATIVE, NEUROPHYSIOLOGY (2 or more). Bollenbacher, Gilbert, Kier, Lohmann, Salmon.

310 RESEARCH IN VERTEBRATE OR INVERTEBRATE ZOOLOGY (2 or more). Feduccia, Kier, Lohmann.

311 RESEARCH IN MYCOLOGY (2 or more). Fall and spring. Staff.

313 RESEARCH IN PLANT PHYSIOLOGY (2 or more). Fall and spring. Jones, Marthysse.

314 RESEARCH IN PLANT MOLECULAR BIOLOGY (2 or more). Fall and spring. Dangl, Reed.
316 RESEARCH IN PLANT SYSTEMATICS (2 or more). Fall and spring. Parks, staff.

317 RESEARCH IN PLANT MORPHOLOGY AND ANATOMY (2 or more). Fall and spring. Gensel.

318 RESEARCH IN PALEOBOTANY (2 or more). Fall and spring. Gensel.

Special Graduate Registration

393 MASTER'S THESIS IN BIOLOGY (3 or more). Fall and spring. Staff.

394 DOCTORAL DISSERTATION IN BIOLOGY (3 or more). Fall and spring. Staff.

DEPARTMENT OF BIOMEDICAL ENGINEERING

BENJAMIN M.W. TSUI, Interim Chair

Professors
* Henry S. Hsiao (3) Medical Instrumentation, Interfacing Microprocessors to Physiological Transducers, Telemedicine
* Robert P. Kusy (41) Biomaterials, Applied Mechanics Structure-Property Relationships, Methodologies and Failure Modes of Cardiovascular Biosensors
* Carol L. Lucas (24) Digital Signal Processing, Mathematical Modeling and Simulation, Pulmonary Circulation in Newborns and Infants
* Benjamin M. W. Tsui (34) Medical Imaging Especially in the Areas of Single-Photon Emission Computed Tomography (SPECT) and Magnetic Resonance Imaging (MRI)

Barry Whistel (52) Computation by Neural Networks, Somatosensory Nervous System, Cerebral Cortex

Research Professor
H. Troy Nagle Jr. (38) Fault-Tolerant Microelectronic Circuits for Implantable Devices, Biosensors, Neural Modeling

Adjunct Professors
Albert Banes, Tissue Engineering
Edward Chaney (101) Image Acquisition Processing and Analysis for Radio Therapy Treatment Planning
Henri Fuchs, Virtual Reality
John E. Hammond (28) Medical Informatics with Emphasis on Clinical Databases, Physician Workstations, Computer System Integration and Applications in Laboratory Medicine
Anthony Hickey (80) Pulmonary Drug Delivery, Aerosol Formulations
William Hammond, Medical Informatics
Ettie Pisano, Medical Imaging, Breast Cancer Research
Stephen M. Fizer (23) Medical Image Processing, Three-Dimensional Display Techniques
Julian Rosenman (102) 3D Medical Imaging in Reconstruction

Associate Professors
* Eric Frey (33) Nuclear Medicine Imaging, Corrective Reconstruction Techniques in Emission Computer Tomography, Application of High-Speed Computers to Image Reconstruction
* Timothy A. Johnson (46) Cardiac Electrophysiology, Biomedical Instrumentation, Biosensors and Control Theory
Stephen Kristie, Cardiac Electrophysiology and Biosensors
* Wei Li, Functional Magnetic Resonance Imaging, Cerebrovascular Disease

Adjunct Associate Professors
Wayne E. Casco, Cardiac Electrophysiology
Steven M. Downs (39) Decision Analysis and Its Applications in Clinical Guidelines Development and Computer-Based Medical Decision Support Systems
Oleg Favors, Somatosensory Cortical Dynamics

*Jeff Thompson, Dental Materials, Fracture Mechanics, Atomic Force Microscopy
Alexander Trophi, Computer Assisted Drug Delivery
Bradley Vaughn, Epilepsy, Sleep Disorders
Barbara Widlowski, Adoption and Use of Information Technologies, Information-Seeking Behaviors and Information Use, Design and Evaluation of Information Systems

Research Associate Professor
* Stephen R. Quint (29) Signal Processing, Systems Analysis, Optimal Ventilation of Neonates

Assistant Professors
* Sanjiv Joshi, Medical Image Processing, Radiation Treatment Planning
* Mark Tommenball (48) Somatosensory Cortical Dynamics and Neurocomputation in Living Neural Networks, Methods for Acquisition and Analysis of Neurophysiology

Research Assistant Professors
* Richard Goldberg, Developing Devices for the Disabled
Bethina Ha, Pulmonary Input Impedance, Pulmonary Artery
* Jeffrey Macdonald, Tissue Engineering, Biorefractive Liver
Paul Weinhold, Orthopaedics, Biomechanics and Biomaterials

Adjunct Research Assistant Professors
David Fenselmaier, Bioinformatics
David L. Latsh (36) Nuclear Medicine Imaging, Tomographic Reconstruction
Algorithms, Medical Image Processing, Three-Dimensional Medical Image Display

Professors Emeriti
N. A. Coulter Jr.
Jacob Hanner
Richard N. Johnson
Lloyd R. Yonce
* basic teaching faculty

Biomedical engineering is a field stressing the application of engineering techniques and mathematical analysis to biomedical problems. The department offers graduate education in biomedical engineering leading to the Master of Science and Doctor of Philosophy degrees.

Students enter this program with backgrounds in engineering, physical science, mathematics, or biological science. Curricula are tailored to fit the needs and develop the potential of individual students. In addition, courses in biosciences, computer science, physiology, and mathematics or engineering provide a well-rounded background of knowledge and skills.

This program is fortunate in its close association with clinical faculty of the School of Medicine. The Department of Biomedical Engineering enjoys close working relations with the departments of Computer Science, Neurology, Physics, Physiology, and Radiology; the Dental Research Center; and the School of Engineering at North Carolina State University. Biomedical Engineering also has close working relations with the Research Triangle Institute and industry within the Research Triangle area. These associations enable students to obtain research training in a wide variety of fields and facilitate the selection and performance of dissertation research. The department thus provides students with excellent opportunities to realize the goal of enhancing medical care through the application of modern technology.

Admission Requirements

In general, students must satisfy the entrance requirements for the Graduate School of the University of North Carolina at Chapel Hill and must demonstrate interest and capability commensurate with the quality of the Biomedical Engineering program. The department requires that a one-to-three-page personal statement about research interest and background be submitted.
Students should have a good working knowledge of mathematics at least through differential equations, plus two years of physical or engineering science and basic courses in biological science. Deficiency in preparation can be made up in the first year of graduate training.

Requirements for Degrees

Candidates for degrees in biomedical engineering must have met the general requirements of the Graduate School. Degree candidates in this program are expected to obtain experience working in a research laboratory during their residence here and to demonstrate proficiency in both teaching and research. The Ph.D. dissertation should be judged by the graduate committee to be of publishable quality.

Courses for Graduates and Advanced Undergraduates

*core curriculum courses

*109 INTRODUCTION TO BIOMEDICAL ENGINEERING (3). Seminar introducing students to biomedical engineering research, including literature search, faculty presentation of ongoing research, and student discussion of research papers. Fall. Staff.

102 BIOMECHANICS (3). Prerequisites: Physics 26, Math 83, and permission of the instructor. Fundamental principles of solid and fluid mechanics applied to biological systems. Human gait analysis, joint replacement, testing techniques for biological structures and viscoelastic models are presented. Papers from the current biomechanics literature are discussed. Fall. Weinhold.

106 SYSTEMS AND SIGNALS (3). Prerequisite: Physics 101 and permission of the instructor. Analysis of linear systems by transform methods to networks, including stability analysis. Spring. Quint.

107 ANALOG AND DIGITAL COMMUNICATION SYSTEMS (APPL 102) (4). Prerequisites: Physics 101 and permission of the instructor. Modulation and demodulation of signals using AM, FM, and PM. Practical applications are studied. Goldberg.

*111 BIOMEDICAL INSTRUMENTATION I (APPL 111) (4). Prerequisite: Physics 101. Topics include basic electronic circuit design, analysis of medical instrumentation circuits, and physiologic transducers (pressure, flow, bioelectric, temperature, and displacement). This course includes a laboratory in which the student builds biomedical devices. Spring. Hsiaw.

112 BIOMATERIALS (3). Chemical, physical, engineering, and biocompatibility aspects of materials, devices, or systems for implantation in or interfacing with the body, cells, or tissues. Food and Drug Administration and legal aspects. Fall. Thompson.

*120 REAL-TIME COMPUTER APPLICATIONS I (APPL 119) (3). Prerequisite, Computer Science 14. Introduction to digital computers for on-line, real-time processing and control of signals and systems. Programming analog and digital input and output devices using C and assembly language is stressed. Case studies are used as vehicles to present software design strategies for real-time laboratory systems. Fall. Lashk.

*121 DIGITAL SIGNAL PROCESSING I (3). Prerequisite, Computer Science 14 or equivalent. This is an introduction to methods of automatic computation of special relevance to biomedical problems. Sampling theory, analog-to-digital conversion, and digital filtering are explored in depth. Spring. Lucas.

128 ANALYSIS AND SYNTHESIS OF DIGITAL SYSTEMS (APPL 104) (4). Prerequisites, Physics 101 and 102. Application of Boolean algebra to the analysis and synthesis of switching circuits; asynchronous and synchronous machines, programmed logic arrays, and fault tolerant design. Includes two hours of laboratory per week. Fall. Quint.

*132 LINEAR CONTROL THEORY (APPL 105) (4). Prerequisite, Math 128 or equivalent. Linear control system analysis and design are presented. Frequency and time domain characteristics and stability are studied. These techniques are applied in an included laboratory. Fall. Johnson.

141 MEDICAL IMAGING I (3). Prerequisites, Math 34, Physics 28. Basic physics of X radiation, gamma radiation, nuclear magnetic resonance, and ultrasound are applied to medical imaging problems. Digital electronics, radiation interaction and detection, image analysis, and counting statistics are treated. Fall. Tsui, Frey.

142 MEDICAL IMAGING II (3). Prerequisite, Biomedical Engineering 141. Modern medical diagnostic imaging techniques and instrumentation are studied, including classical and digital radiography, computed tomography, nuclear medicine, magnetic resonance, and ultrasound. Includes discussion of clinical utility. Spring. Tsui, Frey.

*151 FROM GENES TO TISSUES: MOLECULAR BIOLOGY AND GENETICS FOR BIOMEDICAL ENGINEERS (4). Prerequisites, undergraduate organic chemistry (or biochemistry) and undergraduate biology (or with permission of instructor). An introduction to molecular, cell, and tissue biology for BME students covering molecular genetics, gene expression, self assembling mechanisms, metabolism, bioenergetics, cell organelles, regulation of growth and differentiation, and signaling. Fall. Macdonald, Reid.

152 PHYSIOLOGY AND METHODS IN GENOMICS (5). Prerequisites, BMME 151 or undergraduate organic chemistry or biochemistry and undergraduate biology or with permission of instructor. Lectures in physiology systems and lab techniques covering various functional genomic methods including DNA sequencing, gene arrays, proteomics, confocal microscopy, and imaging modalities. Spring. Macdonald, Reid.

153 BIOMATHEMATICAL MODELING I (3). Prerequisites, engineering level mathematics, e.g., MATH 83, 126. Various approaches to mathematical modeling of biological systems will be considered. The major focus at the cellular level will be expanded to include examples in organs, organisms, and populations. Fall. Lucas.

154 MICROELECTRODE TECHNIQUES (4). Prerequisites, Physics 101 and Biology 11 or equivalent. Methods for measurement of cellular transmembrane voltages with microelectrodes are introduced. Basic and technical aspects of the measurements are described. Students fabricate microelectrodes and measure action potentials in living cells. Spring. Krissley.

160 FUNDAMENTALS OF MATERIALS ENGINEERING (3). The structure, defects, thermodynamics, kinetics, and properties (mechanical, electrical, thermal, and magnetic) of matter (metals, ceramics, polymers, and composites) are considered. Fall. Thompson.

*181 SYSTEMS PHYSIOLOGY FOR BIOMEDICAL ENGINEERS (5). A graduate level introduction to systems and organ physiology. Topics covered will include membrane structure and physiology, muscle physiology, central nervous systems, cardiac electrophysiology, and endocrinology. Fall. Tenmerdahl.

Courses for Graduates

201 BIOMEDICAL INSTRUMENTATION II (3). Prerequisite, Biomedical Engineering 111 or permission of the instructor. The fundamentals of interfacing microprocessor and microcomputers with physiological transducers. Practical circuit design problems are presented with biomedical applications. This course includes a laboratory and individual student projects. Fall. Hsiaw.

212 ADVANCED BIOMATERIALS (3). Prerequisite, Biomedical Engineering 112 or permission of the instructor. Medical or dental implants or explants are highlighted from textbooks, scientific literature, and personal accounts. Spring. Weinhold, Thompson.

220 REAL-TIME COMPUTER APPLICATIONS II (3). Prerequisites, Biomedical Engineering 120, 111. Students design assistive technology devices to help individuals with disabilities to become more independent. Project will be used in the community when it is completed. Spring. Goldberg.

222 HEMODYNAMICS (3). Prerequisites, Biomedical Engineering 102 and Physiology 140 or equivalents. The dynamics of blood flow in blood vessels is studied from the standpoint of modern continuum mechanics. Mathematical models of cardiac action and cardiovascular regulation are included. Fall. (On demand.) Lucas.
223 DIGITAL SIGNAL PROCESSING II (3). Prerequisites, Biomedical Engineering 121, Math 128, and Biomedical Engineering 132 or equivalent. Advanced techniques for analyzing biomedical systems and signals are presented, including signal characterization, pattern recognition, and parameter estimation. Examples from biomedical literature are studied. Spring, Quint.

230 NUMERICAL METHODS FOR BIOMEDICAL ENGINEERING (3). Prerequisites, Math 83, Biomedical Engineering 120, or experience in C or Fortran programming. Emphasis on numerical methods for solving inverse problems relevant to biomedical engineering. Matrix inversion, singular value decomposition, and parameter estimation are covered with an emphasis on application of the methods. Fall. (Alternate years.) Frey.

231 SPECIAL TOPICS (Hours to be arranged). Prerequisite, permission of the instructor. Special library and/or laboratory work on an individual basis on specific problems in biomedical engineering and biomedical mathematics. Direction of students is on a tutorial basis and subject matter is selected on the basis of individual needs and interests. Fall and spring. Staff.

232 DIGITAL CONTROL THEORY (3). Prerequisite, Biomedical Engineering 132 or equivalent. Discrete time systems performance and stability are represented in the time and frequency domains. Series compensation and state variable design techniques are studied. Student projects include discrete time control designs, simulations, and implementation using laboratory devices. Fall. (On demand.) Quint.

233 BIOMATHEMATICAL MODELING (3). Prerequisite, Math 124, 128, or equivalent. Mathematical modeling and computer simulation of physiological and other biomedical systems, with emphasis on application of ordinary and partial differential equations. Analytical and digital solution techniques are considered. Fall. (Even years.) Lucas.

235 FINITE ELEMENT ANALYSIS (3). Prerequisites, Biomedical Engineering 102 or equivalent and permission of the instructor. The underlying principles associated with the finite element method are presented along with applications. Topics to be included are the development of the stiffness matrix, node numbering schemes, potential energy and the Rayleigh-Ritz method, and element selection. Fall. (Odd years.) Lucas.

252 DIGITAL NUCLEAR IMAGING (3). Prerequisites, Biomedical Engineering 141, 142. Advanced topics of physics and instrumentation in nuclear imaging and magnetic resonance techniques. Fall. (Alternate years.) Tsui.

253 ADVANCED MEDICAL IMAGE PROCESSING (3). Prerequisites, Biomedical Engineering 141, 142. Theory and digital implementation of image processing and reconstruction techniques applied in medical imaging are discussed. Specific topics include filtering, edge detection, and image reconstruction algorithms. Spring. (Alternate years.) Tsui.

256 HIGH RESOLUTION X-RAY AND NUCLEAR IMAGING (3). Prerequisites, Biomedical Engineering 141 and 142. Covers design and application of high-resolution x-ray, PET, and SPECT imaging devices for animal imaging. Includes a laboratory portion providing hands-on experience in development and use of these systems. Fall, Tsui, Frey.

260 BIOMATERIALS INSTRUMENTATION (3). Prerequisite, Biomedical Engineering 160 or permission of the instructor. Within a laboratory environment the fundamental or engineering properties of various biomaterials are evaluated. Scientific methodology, data analysis, and technical report writing are stressed. Spring, Easy.

*281 SYSTEMS PHYSIOLOGY FOR BIOMEDICAL ENGINEERS (3-5). Prerequisite, Biomedical Engineering 181. This is the second semester of the 2-semester series intended to provide graduate students with an introduction to systems and organ physiology. Spring, Tommerdahl.

282 INFORMATION PROCESSING IN THE SOMATOSENSORY NERVOUS SYSTEM: BRAIN IMAGING AND DATA ANALYSIS METHODS (3). Prerequisite, Biomedical Engineering 181. Introduction to methodologies used to characterize: (a) the aggregate behavior of living neural networks; and (b) the changes in that behavior that occur as a function of stimulus properties, pharmacological manipulations, and other factors that dynamically modify the functional status of the network. Spring. (Alternate years.) Tommerdahl.

300 LABORATORY ROTATION IN BMME (1). Laboratory practicum. Observational and hands-on experience in state-of-the-art biomedical laboratories with biomedical engineering faculty/preceptor. Fall and spring. Staff.

301 LABORATORY ROTATION IN FUNCTIONAL GENOMICS (1). Prerequisites, Biomedical Engineering 151 and permission of instructor. Students are required to work in two laboratories that involve (1) the creation and analysis of mouse technologies, and (2) developing technologies (biosensors or imaging) for use in functional genomics. Spring. Staff.

311 RESEARCH IN BIOMEDICAL ENGINEERING AND BIOMATHEMATICS (Hours to be arranged.) Prerequisite, permission of the instructor. Staff.

393 MASTER'S THESIS (Hours to be arranged.) Staff.

394 DOCTORAL DISSERTATION (Hours to be arranged.) Staff.

KENAN-FLAGLER BUSINESS SCHOOL

ROBERT S. SULLIVAN, Dean

Professors
Robert Sanford Adler (3) Legal Studies, Business Ethics, Government Regulations
Carl Robert Anderson (80) Strategic Management, Organizational Design, Organizational Decision Making
Gary M. Armstrong (2) Public Policy in Marketing, Sales Force Management
Barry L. Bayus (131) Marketing Research, Technology Changes, Product Management
Richard A. Bettis, Strategic Management, Global Competition, Technological Innovation, Strategic Change
Edward Joseph Blucher (61) Auditing, Management Accounting
Paul N. Bloom (95) Public Policy, Nonprofit Marketing, Marketing Professional Services
Robert M. Bushman, Information Economics, Corporate Governance, Executive Compensation, Organizational Structure
Julie Haney Collins (5) Federal Income Taxes, Tax Compliance, Effect of Taxes on Individual Behavior
Jennifer S. Conrad (107) Market Constraints, Stocks and Options
James W. Dean (158) Quality Management, Strategic Decision Making, Organizational Cynicism
Jeffrey R. Edwards (160) Person-Organization Fit, Work-Family Issues
Douglas Allen Elvers (18) Production/Operations Management, Scheduling, Project Management
John Parkhill Evans (20) Operations Research, Mathematical Programming
John R. M. Hand (126) Financial Accounting, Capital Markets, Market Efficiency
Stuart Hart (163) Environmental Management
David James Harrington (16) Mortgage Bank Securities, Real Estate Investments, Finance
John Dale Kazarda (32) Business Globalization, Privatization, Job Creation
Richard Allan Mann (37) Legal Studies, Regulation of Business, Business Ethics
Ellen Rust Peirce (43) Legal Studies, Labor Law, Government Regulations  
William Daniel Freear Jr. (62) Industrial Marketing, Marketing Research Methods, Marketing Strategy  
John Julius Pringle (45) Financial Management  
William P. Putis, Marketing  
David J. Ravenscraft (10) Mergers, Takeovers, Sell-Offs  
Richard James Rendelman Jr. (89) Investments, Corporate Finance, Capital Markets Efficiency  
Barry Stuart Roberts (63) Legal Studies, Business Ethics, Government Regulation  
Dennis A. Rondinelli (134) International Management, International Economic Development, Public Policy for Development  
Benson Rosen (46) Organizational Behavior, Human Resources Management  
Aleida V. Roth (130) Strategic Decision Making, World Class Manufacturing, Service Quality  
Alber H. Segars (152) Telecommunications Management, Impact of Technology, Corporate-Level Planning for Information Technology  
Debra L. Shapiro (120) Organizational Behavior, Negotiation, Conflict Management  
Michael A. Stegman, Asset-Building in Low-Income Communities, Community Development Finance, Electronic Benefits Transfer, Housing Policy, Real Estate Finance  
Robert S. Sullivan, Business Education, Community Service, Distance Learning, Entrepreneurship, Information and Knowledge Management, Information Technology, Innovation  
Rollie Tillman (51) Marketing Management, Corporate Strategy, Entrepreneurial Ventures  
Harvey M. Wagner (64) Management, Modeling  
Valerie Zeitlin (169) Service Quality, Services Marketing  
Marc Zemerin (94) Corporate Governance, Corporate Finance, International Finance  
Hugh M. O'Neill (131) Corporate Strategy, New Ventures, Turnaround Situations  
Anil Shrivastava (35) Corporate Boards of Directors, Corporate Finance, Corporate Governance, Finance, International Business - Finance, Mergers and Acquisitions, Organizations  
Jayashankar M. Swaminathan, Operations, Technology and Innovation Management  
Harold Zhang, Finance  
Assistant Professors  
Dong-Hyun Ahn (149) Finance  
Henry H. Cao, Finance  
Laura B. Cardinal (155) Innovation, Control Systems and Strategy Implementation  
Kyle D. Cantani (156) Production Planning, Supply-Chain Management, Demand Forecasting  
Brian A. Ciochetti (141) Finance Real Estate Markets  
Geraldo Ferrer (161) Remanufacturing, Reverse Logistics, Product Recovery  
Bin Gao (151) Finance  
Wendell Gilland (162) Production Planning and Control, Capacity Management, Business Process Reengineering  
Eitan Goldman, Corporate Finance, Microeconomic Theory  
Steve E. Hoeffler, Marketing, Consumer Behavior, Decision Making, Sales Forecasting, Information Technology, Electronic Commerce, Internet Marketing  
Nicholas Lute, Consumer and Managerial Decision Making, Inferential Processes and Reasoning, Communication and Signaling, Electronic/Interactive Environments  
Arvind Malhotra, Electronic Commerce, Knowledge Management, Interorganizational Information Technology, Supply Chain Management, Internet Business Opportunities, Internet Startups, Strategic Use of Information Technology, Virtual Teams and Communities  
Jana Smith Raedy (160) Market Efficiency/Anomalous Behavior, Financial Analyst Forecasting  
Rebecca K. Raisen, Consumer Behavior, Decision Making, Individual Decision Making, Marketing  
Adam V. Reed, Finance  
Steven Slezak (148) Finance  
Baehong Sun, Marketing  
Anne Y. Yonk (152) Strategic Management, Research Methods, Finance  
Gal Zauberman, Marketing  
Research Professors  
Michael M. Berry, Corporate Environmental Management Strategies, Environmental Management Systems, Environmental Risk Assessments, Environmental Technology and Services Industry, Management, National and International Environmental Regulatory Programs, Sustainable Development  
Christine M. Pearson (333) Crisis Management, Organizational Culture/Change, Strategic Planning  
Adjunct Professors  
Warren E. Baunach (143) Executive Education, Marketing, Competitive Strategy  
Gerald D. Bell, Leadership, Management, Negotiation, Teamwork  
Bruce Boehm, Management  
Jeffrey T. Glass, Management  
Jaime Gomez, Management  
Eric Ghyzel, Finance  
Noel Gries, Air Logistics, Aviation, Innovation, International Manufacturing, International Operations, Logistics, Manufacturing  
Richard Kouri, CETV
Michael Ian Lueter, Economic Development, Employment and Welfare Policy,
Infrastructure, Public Finance, Urban and Regional Economics
Curtis Perry McLaughlin (39) Production of Services, Professional Productivity,
Management of Nonprofit Organizations
Bill Moore, Investment Banking, Venture Capital, Investment Management,
Entrepreneurship
Diana Ohlinger, Marketing
Jack Olin, Management
Martha Reeves, Accounting
C.J. Skender, Accounting; Auditing, Decision Making

Adjunct Associate Professors
Vikas Mehrotra, Finance
Mabel M. Miguel (53) Career Development, Cross-Cultural Management,
Management, Distance Learning, Management
Elliot Silverstein, Management
Donald McIver Stanford Jr., Commercial Law, Legal Environment of Business,
Management Law, Mutual Funds, Sports Law and Management
Robby B. Sawyers, Accounting

Adjunct Assistant Professors
Sridhar Balasubramanian, Marketing
Peter J. Brews, Management
Elizee Fich, Finance
Douglas B. Guthe, Management
John E. Hogan, Marketing
Susan H. Irons, Business Communication, Professional Communication - Public
School Administrators
Corinne Krupp, Finance Trade, Antidumping Trade, Exchange Rates
Susan Palmer, Human Resource Management - Recruitment, Job Design,
Management, Organizations - Change, Performance Measurement - Employee,
Training and Development
Sara H. Robicheaux, Finance
Heidi Schultz (167) Business Communication
Judy Jones Tisdale, Consumer Banking Retail Sales, Professional Communication,
Sales Coaching and Development
Liliana Wendorff, North Carolina Global Center

Lecturers
James Cotter, Finance
Travis Day, Business Computing Skills
Donald Marples, Management

Adjunct Lecturers
Kenneth G. Braxton, Accounting
William C. Buxton, Compensation, Conflict Resolution, Entrepreneurship, Family-
Owned Businesses, Small Business Management, Strategic Positioning,
Turnaround and Renewal
John T. Gantt, Management
Gregory Hohn, MBA Program
Malcolm Kendall, Management
Paul B. Mayer, Accounting
Donald Marples, Management
Edward G. Pringle, Consulting, Management, Service Industry
Leslie A. Robinson, Accounting
Andrew Silton, EMBA Program
S. Peter Smith, Manufacturing, Marketing - Strategy, Operations Management,
Product Design, Product Development
Amy Ward, Accounting
Kenneth Wiles, Finance
Ronald Williams, Management

Visiting Lecturers
Leonard Homer, Management
Michi Muma, Management
Charles R. Myer, Management
David A.Neal, Management
Cynthia Setzet, Management

Professors Emeriti
Jack N. Behrman
R. Lee Brummet
Dewitt Clinton Dearborn
Robert Desjardins
G. David Hughes
Thomas H. Jerdee
Jay Edward Klopman
Clifton Holland Kreps Jr.
Hans E. Krupa
Harold Q. Langenderfer
J. Finley Lee
Richard Levin
Richard Wolcott McNally
Dannie Joseph Moffie
Isaac Newton Reynolds
William S. Stewart
Junius H. Terrell

The Kenan-Flagler Business School offers programs of graduate study leading
to the degrees of Master of Business Administration, Master of
Accounting, and Doctor of Philosophy. The school is committed to providing
cutting-edge, real-world business education and research. Known for its
collaborative, interdisciplinary approach, the school prepares tomorrow's leaders in business and industry.

The school pioneered the team approach to learning more than a quarter century ago and has more recently added cross-functional, entrepreneurial,
and global priorities to its curriculum.

Kenan-Flagler is recognized for world-class teaching. The faculty consistently
has been nationally ranked for teaching excellence, availability, and
responsiveness to students and emphasis on relevant, applied research and
case development. Through these efforts, the faculty constantly strives to
give students great opportunities for learning.

In fall 1997, Kenan-Flagler moved to its new state-of-the-art facility
located on South Campus. Building features include 18 classrooms with
multimedia capabilities, a 456-seat auditorium, and a 250-plus seat
multi-purpose dining pavilion and activity space.

The world-class McColl Building is a hub of learning, teaching, and
research. Each classroom, office, and study room is designed for maximum
use and technological efficiency to support these activities. The building
includes: an asynchronous transfer mode (ATM) backbone network providing
high-speed transmissions within the school and on the Internet;
ports in many rooms that allow students to connect laptops from virtually
anywhere in the building; a network operating at 100 megabits per second;
a computer lab with state-of-the-art multimedia workstations; and network
servers that provide students with online access to a number of CDs for
company research and historical financial market data.

Master of Business Administration

The Kenan-Flagler Business School's highly ranked M.B.A. program pro-
vides exceptional students the opportunity to develop outstanding func-
tional and analytical skills and the vision of a general manager. The two-
year program combines a first year of core courses designed to provide a
general management background, technical and analytical expertise, and exposure to decision making in all functional areas of business. The second year provides the opportunity to concentrate in areas of student interest and faculty expertise.

Application forms and a brochure containing detailed information may be obtained by contacting the Kenan-Flagler Business School M.B.A. Admissions Office, CB# 3490, McColl Building, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3490; (919) 962-3236; mba_info@unc.edu, www.kenan-flagler.unc.edu/programs/mba.

Master of Accounting

The Kenan-Flagler Business School's Master of Accounting (M.A.C.) program's unique approach to accounting and business education involves a challenging curriculum that integrates accounting with other business disciplines and emphasizes the application of accounting concepts to current business issues. The goal of the accounting and business courses is to create well-rounded business advisers who can compete in the international business world. Rather than specializing in specific areas of accounting, M.A.C. students take a broad but balanced series of accounting courses that focus on skill development, problem solving, and decision making in business situations. The business core courses are designed specifically for M.A.C. students to emphasize accounting and business consulting skills. The program develops students' communication and leadership skills, giving them a competitive advantage in today's right job market and enhancing their ability to succeed in the accounting profession.

The M.A.C. program is designed for candidates holding undergraduate degrees in liberal arts, sciences, business, and other non-accounting disciplines. Candidates earn the M.A.C. degree in twelve months of concentrated study. The application deadlines are August 1 (for UNC business majors only), December 1, and March 1. Because admission is competitive and some decisions are made on a rolling basis, applicants are encouraged to apply early.

Application forms and a brochure containing detailed information may be obtained by contacting the Kenan-Flagler Business School M.A.C. Admissions Office, CB# 3490, McColl Building, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3490; (919) 962-3186; mac_info@unc.edu, www.kenan-flagler.unc.edu/programs/mac.

The Executive M.B.A. Program

The Executive M.B.A. (EMBA) Program provides working professionals the opportunity to acquire the traditional M.B.A. degree without interrupting their careers. Kenan-Flagler offers two attendance options for completing the Executive M.B.A. degree program.

The EMBA Evening Program classes are held on Monday and Thursday evenings for twenty-four months. This program is best suited for professionals who live and work in the Triangle area and have careers that do not require frequent weekday travel.

The EMBA Weekend Program classes are held on alternate weekends (all day Friday and Saturday) for twenty months with two mandatory weeklong residencies for intensive course work. This program is best suited for professionals who travel extensively or who live too far from Chapel Hill to make attending evening classes feasible.

Application forms and a brochure containing detailed information about the program may be obtained by contacting the Executive M.B.A. Program, Kenan-Flagler Business School, The University of North Carolina at Chapel Hill, CB# 3490, McColl Building, Chapel Hill, NC 27599-3490; 1-800-453-9515; emba@unc.edu, www.kenan-flagler.unc.edu/programs/emba.

Doctor of Philosophy

The Ph.D. program in business administration is designed for individuals who plan careers in research and teaching. A limited number of students are admitted each year, resulting in a high-quality learning environment that emphasizes rigor and personal attention. Although many students enter the program with an M.B.A., this degree is not a requirement for admission. However, an M.B.A. from an accredited institution usually allows the student to waive some of the business fundamentals requirements.

Prior to admission to the doctoral program, students are expected to have a knowledge of elementary calculus and basic computer skills. A foreign language is not required for graduation from the program. Research and teaching assistantships are available on a competitive basis.

The requirements for the Ph.D. in business administration are:

- **Business Fundamentals.** All Ph.D. students are expected to possess or to acquire a basic knowledge of accounting, finance, marketing, organizational behavior, and production. This requirement involves a level of competence roughly equivalent to the M.B.A. core courses on these topics. Most students entering with an M.B.A. or similar degree meet this requirement without additional course work. Appropriate courses will be recommended for students who do not meet this requirement prior to beginning the program.

- **Economics.** All Ph.D. students are expected to possess or to acquire a knowledge of microeconomic and macroeconomic theory. The basic requirement is an M.B.A. or graduate-level course on each topic. Once again, most students with an M.B.A. meet this requirement without additional course work. However, individual areas within the Business School (e.g., finance) may require that students take specific courses after entering the program to meet this requirement. Appropriate courses will be recommended for students who do not meet this requirement prior to beginning the program.

- **Research Methods/Quantitative Methodologies.** All Ph.D. students are required to take five courses (fifteen hours) in Research Methods/Quantitative Methodologies. At least one course (three hours) must be a research methods class covering topics such as philosophy of science, research design, sample selection, etc. At least three of the courses (nine hours) must focus on quantitative methodologies such as statistics, operations research, econometrics, etc. The fifth course (three hours) may be a more specialized research methods class (e.g., survey research, lab experimentation) or another quantitative methodologies course.

- **Major Area of Concentration.** All Ph.D. students are required to declare a major area. The major area consists of six courses (eighteen hours). Students may concentrate in one of the following areas:
  - Accounting
  - Operations
  - Finance
  - Organizational Behavior
  - Marketing
  - Strategy

These courses may be a combination of required courses offered within the major area, required courses offered outside of the major area, or approved elective courses.

- **Supporting Area.** All Ph.D. students are required to declare a supporting area. The supporting area consists of four courses (twelve hours). The supporting area allows the student to develop a strong expertise in an area related to the student's research and teaching interests. These courses are usually drawn from a single area within the Business School or from a specific outside department, but a student may assemble four courses from more than one area if the courses represent a coherent package.
**Research Paper.** During the summer and fall following the first year, all Ph.D. students are required to complete a research paper. The paper must be evaluated and approved by the student's faculty. The primary purpose of this paper is to provide the student with important research experience and to develop research and writing skills. Most of these papers are later presented at professional meetings and many lead to publication. Some papers develop into dissertations.

**Comprehensive Examination.** All Ph.D. students must pass a written comprehensive examination on the student's major area of concentration and relevant material from the other requirements. Students usually take this examination after completing course work, typically at the end of the second year. Some areas may require an oral examination after completion of the written examination.

**Dissertation.** All Ph.D. students are required to complete a dissertation prior to graduation from the program. The dissertation is a thorough theoretical and empirical investigation of a specific problem important to the student's major area. The dissertation's value is in its contribution to knowledge, in the scholarly manner in which it is organized and presented, and in the demonstrated development of the student's conceptual and research skills. Before substantial work on the dissertation is undertaken, a written dissertation proposal must be presented and approved by the student's dissertation committee. In most cases, the dissertation proposal is completed during the student's third year in residence and the dissertation is completed during the fourth year.

**Teaching and Research.** All students are required to serve as a teaching assistant for at least one semester and as a research assistant for at least one semester. Students are also required to work with faculty prior to that semester on the development of their teaching skills.

**Scholarships and Fellowships**

Available to doctoral students in business administration are a number of assistantships, each with a value of $12,900 for the academic year. The school provides summer assistantships for doctoral students who receive awards from the University or the school during the academic year. These assistantships carry stipends of $3,100 for the summer. Once a doctoral student is awarded financial aid, the school generally provides support for eight semesters if the student is making satisfactory academic progress.

To receive an application and brochure containing detailed information, contact the Ph.D. Program Office, Kenan-Flagler Business School, CB# 3490, McColl Building, Chapel Hill, NC 27599-3490; (919) 962-3126; kfphd_app@unc.edu , www.kenan-flagler.unc.edu/programs/phd.

**Courses for Doctoral Candidates**

**299B COMMUNITY CAPITALISM I (PLAN 260)** (1.5). Seminar explores community capitalism perspectives with emphasis on capital formation and innovations in community development finance and business-driven investment strategies. Spring, Steigman.

**299C COMMUNITY CAPITALISM II (PLCY 261)** (1.5). Prerequisite, PLCY 260 or permission of instructor. Builds on Community Capitalism I. Seminar explores community development technological innovations in financial services industry, implications of asset building strategies for low income communities, and investment opportunities in inner city markets. Spring, Steigman.

**301 QUANTITATIVE METHODS IN MANAGEMENT II** (3). Prerequisite, Business Administration 300 or equivalent. Statistical inference, analysis of variance, regression and correlation, time series analysis, multiple regression, design of experiments, statistical decision theory. Spring, Staff.

**307 SEMINAR IN THE HISTORY OF MANAGEMENT THOUGHT** (3). An advanced course dealing with the evolution of management thought. Spring, Staff.

**308 APPLIED RESEARCH METHODS I** (3). Addresses fundamentals of empirical social science research. Topics include framing a research question, comparing research designs, instrumentation, reliability, validity and exploratory and confirmatory factor analysis. Emphasizes application and analysis.

**309 APPLIED RESEARCH METHODS II** (3). Continuation of Applied Research Methods I. Topics include statistical control, categorical variables, interaction, curvilinearity and similarity effects. Longitudinal analysis, path analysis, structural equation modeling and publication. Emphasizes application and analysis.

**330 THEORY OF OPERATIONS MANAGEMENT I** (3). Prerequisite, permission of the instructor. Rigorous study of traditional and modern issues, problems, and approaches in operations management. Fall, Staff.

**331 THEORY OF OPERATIONS MANAGEMENT II** (3). Prerequisite, Business Administration 330 or equivalent. A continuation of Business Administration 330. Spring, Staff.

**332 THEORY OF OPERATIONS MANAGEMENT III** (3). Prerequisite, Business Administration 331 or equivalent. A continuation of Business Administration 331. Fall, Staff.

**337 ADVANCED TOPICS IN OPERATIONS MANAGEMENT** (3). Prerequisite, permission of the instructor. Intensive study of a specific area in operations management. Fall, Staff.

**338 SEMINAR IN OPERATIONS MANAGEMENT** (3). Prerequisite, permission of the instructor. Intensive study of a specific area in operations management. Spring, Staff.

**351 INDIVIDUAL BEHAVIOR IN ORGANIZATIONS** (3). Analysis of individual behavior, adjustment, and effectiveness. Examination of attitudes, stress, problem solving, decision making, motivation, and personality. Applications to management of human resources. Fall, Staff.

**352 INTERPERSONAL AND INTERGROUP BEHAVIOR IN BUSINESS ORGANIZATIONS** (3). Intensive critical examination of interpersonal and intergroup behavior, including decision processes, communication, conflict, and conflict resolution in large organizations. Case studies are used to illustrate applications in business. Spring, Shapiro.

**353 MACRO ORGANIZATIONAL BEHAVIOR** (3). Prerequisite, graduate standing in business administration. Intensive study of theory and research in organizational structure, coordinating and control mechanisms, design parameters, and environments. Spring, Staff.

**354 ORGANIZATIONAL DESIGN AND DEVELOPMENT** (3). The development of understanding and skills in changing and evolving organizational design, interpersonal relationships, and people to achieve organizational goals. Spring, Staff.

**355 METHODS IN ORGANIZATIONAL BEHAVIOR RESEARCH** (3). Research in organizational behavior with consideration of establishing experimental designs, data collection, and application of appropriate methods in the analysis of data. Spring, Blackburn.

**356 SEMINAR IN ORGANIZATIONAL BEHAVIOR** (3). Prerequisite, permission of the instructor. Intensive study of important current theory and research in organizational behavior. Fall, Staff.

**357 SEMINAR IN HUMAN RESOURCE MANAGEMENT** (3). Prerequisite, Business Administration 250 or equivalent. Review of research in human resource planning, acquisition, control, training, compensation, and related human resource topics. Fall, Rosen.

**360 SEMINAR IN MARKETING I** (3). Prerequisite, permission of the instructor. Overview of current paradigms and research in marketing. Topics include philosophy of science, differing views of what marketing is, strengths and weaknesses of various research approaches, and career socialization issues. Fall, Staff.
361A SEMINAR IN MARKETING II (3). Prerequisite: Business Administration 360. Intensive study of problems in design of distribution channels, marketing logistics, promotional decisions and evaluations, sales forecasting, and analysis. Spring. Bloom, Bayus.

361B SEMINAR IN MARKETING II (3). Prerequisite: Business Administration 360. Intensive study of empirical and analytical models in consumer behavior, pricing, product development and management, advertising and promotion, distribution, and strategy. Spring. Staff.

365 SEMINAR IN CURRENT MARKETING TOPICS (1). Prerequisite: permission of the instructor. Advanced research in marketing. A seminar to discuss current research of doctoral candidates, faculty, and invited guests. Fall and spring. Armstrong.

367 ISSUES IN THE DESIGN AND ANALYSIS OF RESEARCH IN MARKETING (3). Prerequisite: graduate standing in business administration. A review of major issues in marketing, including philosophy of science, measurement, and experimental and quasi-experimental design. Fall. Perreault.

368 SEMINAR IN MARKETING RESEARCH METHODOLOGY (3). Prerequisite: permission of the instructor. An introduction to multivariate data analysis methods including factor analysis, cluster analysis, logic, discriminant analysis, and multidimensional scaling. Spring. Mason, Perreault.

376 SEMINAR IN RESEARCH IN ACCOUNTING (1). Prerequisite: permission of the instructor. An informal seminar to discuss current research in accounting. Fall and spring. Staff.


380 THEORETICAL FINANCIAL MANAGEMENT I (3). Prerequisite: permission of the instructor. Introduction to the theories of asset pricing. Fall. Conrad, Gültekin, Rendleman.

381 THEORETICAL FINANCIAL MANAGEMENT II (3). Prerequisite: Business Administration 380 or equivalent and permission of the instructor. Review of various aspects of the theory of financial management, and critical evaluation of the theory's usefulness to financial managers. Spring. Staff.

382 TOPICS IN FINANCIAL MANAGEMENT: Spring. Staff.

385 SEMINAR IN RESEARCH IN FINANCE (0 to 1). Prerequisite: permission of the instructor. Advanced research in business finance and investment. An informal seminar to discuss current research of doctoral candidates, faculty, and others. Fall and spring. Staff.

386 SEMINAR IN PORTFOLIO MANAGEMENT (Economics 386) (3). Prerequisite: permission of the instructor. Development, testing, and economic effects of models for determining the selection of assets. Fall or spring. Conrad, Gültekin.

387 QUANTITATIVE METHODS IN FINANCE (3). Prerequisite: permission of the instructor. Review of information generating and optimizing models and their applicability to decision-making in finance. Fall. Conrad, Gültekin.

388 SEMINAR IN FINANCIAL MARKETS (3). Prerequisite: permission of the instructor. Intensive study of market characteristics and interrelationships, market price and yield determination, impact of monetary and regulatory policies, and effect of market structure on performance. Spring. Staff.

390 STRATEGIC MANAGEMENT OVERVIEW (3). A seminar to provide a broad and current understanding of strategic management. Exposure to the entire field is emphasized. Bettis, Ilintich, O'Neill.

391 STRATEGIC FORMULATION (3). Prerequisite: Business Administration 390. This seminar emphasizes both process and content issues to provide students with an in-depth understanding of strategy formulation topics. Bettis, O'Neill.

392 STRATEGY IMPLEMENTATION (3). Prerequisite: Business Administration 390 and 391. This seminar focuses on strategy implementation, with particular emphasis devoted to the process, systems, and structures required for effective implementation.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

399 SEMINAR (3). Prerequisite, permission of the instructor. Individual research in a special field under direction of a member of the department. Fall and spring. Staff.

DEPARTMENT OF CELL AND DEVELOPMENTAL BIOLOGY

VYTAS A. BANKAITIS, Chair

Professors

Vytas A. Bankaitis (4) Signal Transduction, Generic Models for Neurodegenerative Disease in Mice, Yeast Genetics and Cell Biology

Keith W. T. Burridge (41) Cell Movement, Cytoskeleton, Interactions of Cells with the Extracellular Matrix, Signaling Downstream from Adhesion

Johnny L. Carson (5) Developmental Biology, Pathogenic Mechanisms Involving Mammalian Airways

M. Joseph Costello (50) Membrane Biophysics, Intracellular Junctions, Active Transport, Membrane Fusion, Electron Microscopy

Noelle A. Granger (42) Developmental Biology, Endocrinology, Neuroendocrinology

O'Dell W. Henson Jr. (19) Ear Structure and Function, Animal Sonar

Kenneth A. Jacobson (59) Membrane Biology and Biophysics, Cell Migration, Video Image Analysis

William E. Koch (8) Developmental Biology

Jean M. Lauter (56) Developmental Neurobiology - Roles of Neurotransmitters, Growth Factors and Hormones in Brain Development, Neuronal-Glial Interactions

John J. Lemasters (29) Cellular and Molecular Mechanisms of Apoptosis and Necrosis to Liver and Heart Cells; Organ Preservation for Transplantation Surgery; Mitochondrial Permeability Transition; Confocal and Multiphoton Microscopy of Living Cells; Mechanisms of Kupffer Cell Activation; Mitochondrial Calcium Homoeostasis

Royce L. Montgomery (11) Invertebrate Disc Lesions and Back Pain

Michael G. O'Rand (38) Cell Biology, Immunology, Reproductive Biology

H. Benjamin Peng (49) Cellular and Developmental Neurobiology, Development of the Neuronal Junction

Petr Petrusz (13) Neurobiology, Neuroendocrinology, Reproductive Biology

Aldo Rusconi (15) Neuroanatomy, Neurophysiology, Neurocytology

Thomas W. Sadler (46) Teratology, Developmental Biology, Organ and Whole Embryo Culture

Kathleen K. Sulik (40) Developmental Toxicology, Embryology

Associate Professors

Patrick Brennwald (5) Cell Polarity, Tumor Suppressor, Vesicle Transport, Exocytosis, Rho GTPases

Douglas M. Cry (6) Cytoskeletal Organization, Microtubule Biogenesis, Protein Folding, Molecular Chaperones, the Ubiquitin-Proteasome Pathway

Sharan L. Millgram (8) Epithelial Biology, Trafficking and Polarity, Signal Transduction in Polarized Cells, Scaffolding and Adaptor Proteins

Andrew J. Morris (7) Roles of Lipids in Cellular Regulation, Signal Transduction in Normal and Cancerous Cells

Deborah A. O'Brien (51) Mammalian Spermatogenesis and Fertilization, Expression and Function of Tissue-Specific Gene Products During Germ Cell Differentiation

Michael D. Schaller (2) The Integrins, Protein Tyrosine Kinases and Signal Transduction
Ellen R. Weis (9) Regulatory Domains of G-Protein Coupled Receptors, Molecular Biology of Cellular Signaling Pathways

Assistant Professors
Jay E. Brennan (10) Neuronal Development, Drosophila and Mouse Genetics, Desmin and Actin Morphogenesis
Mohanty P. Deshmukh (3) Neuronal Apoptosis, Molecular Mechanism of Programmed Cell Death, Regulation of Caspase Activation

Research Associate Professors
Shoji Osawa (16) Regulation of Signal Transduction Pathways by G Proteins
Richard Weinberg (20) Quantitative Immunocytochemistry, Organization of Glutamate Receptors and Second Messengers, Nitric Oxide Synthase

Research Assistant Professors
James Ahl, Role of Phosphatidylinositol Transfer Protein Alpha in Mammalian Systems
Shao-Ya Chen, Developmental Toxicology, Embryology
Jorge Daniel Cereso
Gerald W. Gordon (14) Instrument Development for Cell Biology Research
Kiyoshi Miki, Sperm Motility, Death Signaling in Male Germ Cells
Timothy Oliver, Cell Locomotion, Cytoskeletal Dynamics, Emerging Light Microscopy
Ting Qian
Richard Richardson (17) Molecular Biology of Sperm-Oocyte Interaction, Studies of Immunocomplexation
Parth Roy, Studying Cell Locomotion Using Photomanipulation of Actin Binding Proteins
Julie Vallaschonoff, Electron Microscopy of Synaptic Proteins, Nitric Oxide, Spinal Pain Mechanisms
Zhi Zhong, Hepatology and Toxicology, Renal Toxicity of Immunosuppressive Drugs, Organ Preservation for Transplantation Surgery, Ischemia/Reperfusion Injury, Mechanisms of Kupffer Cell Activation

Instructor
Linda Levitch

Professors Emeriti
Charles R. Hackett
William S. Pollin

Program of Study
The Department of Cell and Developmental Biology of the School of Medicine offers a program of study leading to the Doctor of Philosophy degree. The program provides training for students whose research/teaching career objectives are faculty positions in medical school cell biology/anatomy departments. However, the flexibility of the program also provides for the training of students who seek careers in basic science as well as clinical science departments of medical schools; in other professional schools such as dental schools; in liberal arts academic departments such as biology; or in state, federal, private, and industrial research laboratories. The program for the Ph.D. normally takes four to five years to complete. Persons interested in a combined M.D./Ph.D. program must be accepted into the School of Medicine and the departmental graduate program, whereupon the combined studies are scheduled in accordance with individual requirements.

Some of the department's areas of specialization are cell biology, developmental biology, neurobiology, reproductive biology, endocrinology, bioincoysis, membrane biology, molecular biology, and cell signaling. Ph.D. students receive broadly based training in these areas before examination for advancement to candidacy. Ph.D. candidacy is followed by optional further formal study while a dissertation based on original research is prepared under the supervision of a faculty adviser. All students are encouraged to develop a strong background in the various aspects of contemporary cellular and biophysical studies, with individual programs varied to suit the particular interests and previous training of each student. Students are required to complete a course in biostatistics or computer science.

Admission Requirements
A B.A. or B.S. degree is required for admission. Applicants are expected to have a strong background in the biological sciences, chemistry, physics, and mathematics. A complete application including transcripts, GRE scores (with a subject test score), and three letters of recommendation should be sent to the Office of the Graduate School, Byrum Hall. A letter outlining career goals and why they would be helped by study in the department is also required. Complete applications for full registration should be received no later than January 1. Prospective students are advised to contact the director of graduate studies in Cell and Developmental Biology and faculty members whose fields interest them.

Research Facilities
The department occupies twenty-nine thousand square feet of research and office space in addition to teaching space, primarily in Taylor Hall in the School of Medicine. The department and its research laboratories are a biotechnological resource available for qualified scientists in the University, state, and region. The laboratories house instrumentation for transmission, scanning, intermediate high voltage, and freeze fracture electron microscopy, as well as equipment to prepare biological specimens for these techniques. The Electron Microscope Laboratories contain a multi-purpose JOEL 4900 scanning electron microscope and a high resolution JOEL 200 CX intermediate voltage (200kV) electron microscope. Ancillary facilities include four fully equipped darkrooms and equipment for ultra- and cryo-electron microscopy, critical point drying, rotary evaporation, sputter coating, a fully equipped Balzers freeze-fracture instrument, and a state-of-the-art, high resolution Reichert cyrofracture system. A world class facility is available for optical imaging of all kinds: digitized video microscopy; confocal microscopy and fluorescence lifetime imaging microscopy; nanoview microscopy; and fluorescence recovery after photobleaching.

Assistantships and Other Student Aid
Students are supported by a stipend of $18,500 annually plus tuition, fees, and medical insurance.

Courses for Graduates and Advanced Undergraduates

102 HUMAN HISTOLOGY (4). Prerequisite, permission of the instructor. Introduction to the study of cells, organized tissues, and organ systems at levels of the light and electron microscopes with emphasis on human material. Spring. Lemasters, staff.

104 INTRODUCTION TO MEDICAL CELL BIOLOGY (1). Introduction to the structure and function of cell membranes, membranous organelles, the nucleus, and the filamentous components of the cytoplasm. Fall. Burridge. For medical students only.


107a GROSS ANATOMY (6). Prerequisite, permission of the instructor. Primarily for medical students. Graduate enrollment by availability of space and material. One lecture, six laboratory hours, fall; two lectures, six laboratory hours, eight weeks of spring. Grasger, staff.
109 HUMAN DEVELOPMENT (1). Overview of normal human embryological development from fertilization to parturition with an emphasis on the origin and causes of congenital malformations. Fall. S. Adler.

117 CELL STRUCTURE, FUNCTION AND GROWTH CONTROL I (Microbiology and Immunology 117, Biochemistry 117, Pharmacology 117) (3). Prerequisite: undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function and transformation. Fall. Jacobson, Lee, Meissner, Parise.

118 CELL STRUCTURE, FUNCTION AND GROWTH CONTROL II (Microbiology and Immunology 118, Biochemistry 118, Pharmacology 118) (3). Prerequisite: undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function and transformation. Spring. Jacobson, Lee, Meissner, Parise.

121 DEVELOPMENTAL BIOLOGY (3). A comprehensive course covering basic principles and current topics in developmental biology, including patterning, cell signaling, cell differentiation, and growth regulation. Spring. Lauder.

123 DEVELOPMENTAL TOXICOLOGY AND TERAOTOLOGY (Toxicology 123) (2). Emphasis is placed on topics of current research interest relative to the genetics of environmental and genetic birth defects. One two-hour session per week (evening). Spring. (Alternate years.) Sulik.

191 GROSS ANATOMY FOR PHYSICAL AND OCCUPATIONAL THERAPISTS (Physical Therapy 191) (6). Prerequisites: Biology 63 and 63L and permission of the instructor. Fundamentals and concepts of human gross anatomy for physical therapists taught by lecture and cadaver dissection. Emphasis on functional anatomy. Three lecture and six laboratory hours a week. Fall. Staff.

193 FUNCTIONAL NEUROANATOMY (Physical Therapy 193) (3). Prerequisites: Cell Biology and Anatomy 191, Cell Biology and Anatomy 107 or equivalent, and permission of the instructor. Study of basic structure of the brain and spinal cord, including both lecture and laboratory. Primarily for physical therapy students. Four hours a week. Spring. Staff.

Courses for Graduates

200ab ADVANCED GROSS ANATOMY (4/3). Prerequisites, Cell Biology and Anatomy 107ab and/or permission of the instructor. Detailed dissection of the human body. Specific regions may be selected; topics include topographic, radiographic, and cross-sectional anatomy. Fall and spring. Grainger.

207 REGIONAL ANATOMY (3). Prerequisite, permission of the instructor. For students of oral surgery, surgical residents, and graduate students. Second summer session. Montgomery.

209 ELECTRON MICROSCOPY: PRINCIPLES AND APPLICATIONS (3). Permission of the instructor. Lectures on scanning, transmission, high voltage, freeze fracture, analytical and immunoelectron microscopy. Laboratory training in preparation of biological specimens, operation of scanning and transmission microscopes, and darkroom procedures. Three lecture and twelve laboratory hours per week. First summer session. Costello.

301 SEMINAR IN CELL BIOLOGY AND ANATOMY (2). Prerequisites, permission of the instructor and/or enrollment in the cell biology and anatomy graduate program. A series of weekly readings and presentations by students on current research in cell biology and anatomy. Spring. (Alternate years.) Staff.

310 RESEARCH (2 or more). Credit to be arranged in individual cases. Fall, spring, and summer. Staff.

315 RESEARCH LABORATORY APPRENTICESHIP (2). Prerequisite, enrollment in the cell Biology and Anatomy graduate program. A course for first- and second-year graduate students in Cell Biology and Anatomy, consisting of a research project of limited scope pursued under the supervision of a faculty member. Fall, spring, summer. Staff.

320ab ADVANCED TOPICS IN CELL AND DEVELOPMENTAL BIOLOGY (Var.). Prerequisite, permission of instructor. Seminar/discussion course dealing with advanced topics in modern cell biology and/or developmental biology. Based mainly on discussion of current literature. Fall, spring. Staff.

321ab CONTEMPORARY APPROACHES TO SOLVING BASIC PROBLEMS IN CELL AND DEVELOPMENTAL BIOLOGY (3). Prerequisite, permission of instructor. Analysis of grant proposals dealing with advanced topics in modern cell biology and/or developmental biology. Spring, fall. Bankaitis.

393 MASTER'S THESIS (3).

394 DOCTORAL DISSERTATION (3).

DEPARTMENT OF CELL AND MOLECULAR PHYSIOLOGY

JAMES M. ANDERSON, Chair

Professors


Associate Professors

Assistant Professors
Eva Anton (76) Molecular Analysis of Neuronal Migration and Development of Cerebral Cortex
Sela Magar (71) Molecular Biology and Biophysics of Neurotransmitter Transporter
Carol A. Otey (73) Mechanisms of Cell Adhesion, Cell Migration and Cytoskeletal Organization, and Neuronal Cell Biology

Research Associate Professor
C. William Davis (51) Airway Epithelial Cell Physiology
Research Assistant Professor
Scott Randell (75) Airway Epithelial Cell Biology

Adjunct Professors
Anthony C. Hackney (21) Systemic Endocrinology and Physiology; Exercise Endocrinology; Regulation of Steroid Hormone Production
Kathleen C. Light (61) Behavioral Stress and the Cardiovascular System

Professors Emeriti
Robert G. Faust
Enid R. Kafri
Joseph H. Perlmutt
Lloyd R. Vance

Requirements for Admission
Applicants to the program must have a strong undergraduate record including course work in organic chemistry and biochemistry, two semesters of calculus and physics, and appropriate course work in the biological sciences, such as zoology, genetics, cell biology, and molecular biology. All applicants are required to submit scores on the GRE aptitude test, a written statement, transcripts, and a minimum of three letters of recommendation. Applications are welcome at any time but should be received by December 1 to receive priority consideration for financial support. A personal interview is highly recommended.

Courses for Graduate and Professional Students

114 PHYSIOLOGY (Dentistry 114) (4). This basic physiology course introduces students to the functions of and interactions between the various systems of the body. Particular emphasis is placed on those concepts of specific relevance for students and practitioners of dentistry. The course also provides students with a solid physiological background for subsequent courses within the dentistry curriculum. Spring. Mosu, staff.

122 DEVELOPMENTAL NEUROBIOLOGY (Cell Biology and Anatomy 122) (Neurobiology 122) (3). Prerequisite, permission of the instructor. A survey of nervous system development emphasizing detailed analysis of selected research topics such as neural induction, neural crest development, neuronal differentiation, synapse formation, neurotrophic factors, glial development, and the effects of experience. On demand. Staff.

125 GENE EXPRESSION AND MANIPULATION (3). Prerequisite, permission of the instructor. Introductory cell and molecular methodology for derivation and characterization of genetically manipulated cells and animals; transcriptional control; application to normal organ function and mechanisms of disease. Fall. Lind, Sealock, staff.

140A MEMBRANE PHYSIOLOGY (1). Prerequisite, biochemical or permission of instructor. Membrane potentials, ion channels, synaptic transmission and secretion, and membrane transport. Lecture/discussion format; texts supplemented by critical readings of classical and modern research articles. On demand. Sealock, staff.

140B ENDOCRINE PHYSIOLOGY (1). Prerequisites, biochemical and molecular or cell biology or permission of instructor. Physiology of endocrine and signal transduction. Lecture/discussion format; texts supplemented by critical readings of classical and modern research articles. On demand. Staff.

189 NUCLEIC ACID TECHNIQUES (Biology 189, Genetics 189, Microbiology 189) (4). Prerequisites, some molecular biology and permission of the instructor. An intense hands-on course covering many aspects of recombinant DNA technology such as isolation of nucleic acids, gel analysis, Southern and Northern blotting, cloning in viruses and plasmids, and DNA sequencing. Fee required. Some scholarship available. Eight laboratory hours. Fall, spring, summer. Likater.

190 TEACHING OF PHYSIOLOGY (1). Prerequisite, permission of the instructor. Instruction in techniques of lecturing. Includes delivery of formal, coached lectures on topics in physiology. Fall and spring. Faber, staff.

200 HUMAN PHYSIOLOGY (5). Prerequisite, permission of the course director. A special section (for physiology graduate students only) of the course for medical students. The course provides a general consideration of cell function and of systemic physiology. Four lecture and two laboratory hours a week. Spring. McIwain, staff.

201 NEUROBIOLOGY (Neurobiology 201) (3). Prerequisite, permission of the course director. A special section (for physiology graduate students only) of the neurobiology course for medical students. Structural and functional organization is analyzed at the level of the cell membrane, the neuron, and integrated neuronal systems. Spring. Farel, staff.
210 PHYSIOLOGY LABORATORY ROTATION (1-6). Prerequisite, permission of the director of graduate studies. Rotations in faculty laboratories introduce methods and techniques in physiology. Individual projects provide an opportunity to explore potential dissertation topics. Fall, spring, summer. Staff.

211 SPECIAL TOPICS IN PHYSIOLOGY (Neurobiology 211) (3-5). Prerequisite, permission of the instructor. Individually arranged in-depth programs of study of selected topics such as membrane function, transport physiology, renal physiology, etc. Fall. Staff.

212 SPECIAL TOPICS IN PHYSIOLOGY (Neurobiology 212) (3-5). Prerequisite, permission of the instructor. Individually arranged in-depth programs of study of selected topics such as membrane function, transport physiology, renal physiology, etc. Spring. Staff.

220 SEMINAR IN PHYSIOLOGY (1). Prerequisite, permission of the departmental director of graduate studies. Students present and discuss their own research and/or review papers to develop skills needed to evaluate and present scientific research. Fall. Anon, Otey.

221 SEMINAR IN PHYSIOLOGY (1). Prerequisite, permission of the departmental director of graduate studies. Students present and discuss their own research and/or review papers to develop skills needed to evaluate and present scientific research. Spring. Anon, Otey.

222A CELLULAR AND MOLECULAR NEUROBIOLOGY: ELECTRICAL SIGNALING (2). Prerequisite, permission of instructor. Considers the genesis of electrical impulses in the nervous system with emphasis on membrane potentials, voltage-gated ion channels, and structural features of neurons that influence coding. Course meets for five weeks with six lecture hours per week. Fall. Stuart.

222B CELLULAR AND MOLECULAR NEUROBIOLOGY: Postsynaptic MECHANISMS-RECEPTORS (2). Prerequisite, permission of instructor. Consideration of membrane receptor molecules activated by neurotransmitters in the nervous system with emphasis on ligand binding behavior and molecular and functional properties of different classes of receptors. Course meets for four weeks with six lecture hours per week. Fall. Stuart.

222C CELLULAR AND MOLECULAR NEUROBIOLOGY: PRESYNAPTIC MECHANISMS (2). Prerequisite, permission of instructor. The mechanisms regulating the release of neurotransmitters from nerve terminals are explored including quantal release, vesicle and terminal membrane proteins, neurotransmitter transporters, and plasticity of synaptic transmission. Course meets for five weeks with six lecture hours per week. Fall. Stuart.

223A CELLULAR AND MOLECULAR NEUROBIOLOGY: Postsynaptic MECHANISMS-INTRACELLULAR SIGNALING (2). Prerequisite, permission of the instructor. Explores biochemical signal transduction events following activation of neurotransmitter receptors including G-protein coupling, desensitization, signaling specificity, downstream effectors, calcium signaling and tryptophan kinases. Course meets for five weeks with six lecture hours per week. Spring. Stuart.

223B CELLULAR AND MOLECULAR NEUROBIOLOGY: DEVELOPMENTAL NEUROBIOLOGY (2). Prerequisite, permission of instructor. The molecular and cellular basis for development of neurons and networks. Topics include the basic CNS embryogenesis, molecular basis of neurite extension and pathfinding, specification of cell fate, and synaptogenesis. Course meets for five weeks with six lecture hours per week. Spring. Stuart.

224 PAIN AND SOMATIC SENSATION (Neurobiology 224) (2). Prerequisites, PHYI 140 or equivalent and permission of the instructor. Consideration of peripheral and central neural mechanisms for somatic sensation with particular emphasis on pain. Spring. Perl.

240 ADVANCED CONCEPTS IN PHYSIOLOGY (3). Prerequisites, PHYI 200 and permission of the instructor. Blood pressure control in normal, diseased, and genetically modified animals. Physiology and pathophysiology of the renal and cardiovascular systems. Fall. Arendshorst, Goy, staff.

290 SEMINAR IN NEUROBIOLOGY (Biochemistry 290) (Neurobiology 290) (Pharmacology 290) (3). Prerequisite, permission of the director of the Neurobiology Curriculum. An intensive consideration of selected topics and problems. The course focuses on the development of presentation and evaluation skills of the trainee. Spring. Faculty of the Neurobiology Curriculum.

301 RESEARCH IN PHYSIOLOGY (3-10). Fall. Staff.

302 RESEARCH IN PHYSIOLOGY (3-10). Spring. Staff.

303 RESEARCH IN PHYSIOLOGY (3-10). Summer. Staff.

310 RESEARCH IN NEUROBIOLOGY (Biochemistry 310) (Neurobiology 310) (Pathology 310) (Pharmacology 310) (Psychology 310) (Biology 302) (3-12). Prerequisite, permission of a staff member. Research in various aspects of neurobiology. Six to twenty-four hours a week. Fall and spring. Faculty of the Neurobiology Curriculum.

393 MASTER'S THESIS (3 or more). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

DEPARTMENT OF CHEMISTRY

JAMES W. JORGENSON, Chair

Professors
Tomas Baer (1) Physical Chemistry
Max L. Berkowitz (30) Physical Chemistry
John J. Boland (10) Chemistry of Electronic Materials
Maurice S. Brookhart (2) Organic and Organometallic Chemistry
Michael T. Crimmins (39) Organic Chemistry
Joseph M. DeSimone (49) Synthetic Polymer Chemistry
Thom Dunning, Physical Chemistry
Malcolm D. E. Forbes (48) Organic and Physical Chemistry
Gary L. Glish (40) Analytical Chemistry
Eugene A. Irene (38) Electronic Materials, Solid State Chemistry
Charles S. Johnson Jr. (18) Physical Chemistry
James W. Jorgenson (36) Analytical Chemistry
Paul J. Kropp (20) Organic Chemistry
Susan T. Lord (50) Biological Chemistry
Roger E. Miller (29) Physical Chemistry
Royce W. Murray (25) Analytical Chemistry
Robert G. Parr (34) Physical Chemistry
Lee G. Pedersen (26) Physical Chemistry
Gary J. Pielak (46) Biological Chemistry
Michael Rubinstein (43) Polymer Physical Chemistry
Edward T. Samulski (44) Polymer Physical Chemistry
Thomas N. Sorrell (35) Organic Chemistry
Linda L. Spremulli (28) Biological Chemistry
Joseph L. Templeton (31) Inorganic Chemistry
Nancy L. Thompson (41) Physical and Biological Chemistry
H. Holden Thorp (51) Inorganic Chemistry
R. Mark Wightman (47) Analytical and Neurochemistry
Richard V. Wolfenden, Biological Chemistry

Associate Professors
Dorothy A. Eise (11) Physical and Biological Chemistry
Michel R. Gagne (22) Inorganic, Organic, and Polymer Chemistry
Cynthia K. Schauer (45) Inorganic Chemistry
Kevin M. Weeks (53) Biological Chemistry

Assistant Professors
Jeffrey S. Johnson (58) Organic Chemistry
Weibin Lin (60) Inorganic Chemistry
James P. Morken (42) Organic Chemistry
Research Interests


**Biological.** Kinetics in complex biochemical systems; molecular biology and molecular genetics; mechanism of protein biosynthesis; metabolic regulation; gene organization and regulation of gene expression; structural studies of macromolecules; protein structure function using nuclear magnetic resonance spectroscopy, protein folding and site-directed mutagenesis; the thermodynamics of protein-protein interactions; protein stability; characterization of proteins by laser light scattering; characterization of protein/DNA complexes using scanning force microscopy and rapid mixing techniques; RNA structure, assembly of complex RNA-protein architectures, protein-facilitation of RNA catalysis; chemical synthesis of peptides and proteins; microanalysis of peptides and proteins; protein engineering through chemical synthesis; biochemical studies of the serum complement and clotting cascades; molecular immunology; computer graphics and molecular modeling of biomolecules; mathematical methods for comparison of genetic sequences; cell surface biophysics; fluorescence microscopy and spectroscopy.

**Inorganic.** Physical inorganic chemistry; electronic structure of transition metal complexes; photochemistry and electrochemistry of metal complexes; molecular orbital theory; nuclear magnetic resonance and electron paramagnetic resonance spectroscopies; X-ray crystallography; infrared and Raman spectroscopies. Chemistry of transition metal complexes; synthesis of transition metal compounds, organometallic chemistry including metal-catalyzed organic reactions; reactions of coordinated ligands; kinetics and mechanisms of inorganic reactions; metal cluster chemistry; chiral supramolecular chemistry. Materials chemistry: molecular precursors to materials; solid state lattice design; metal-ion containing thin films; metal-polymer complexes; functional coordination polymers; chiral porous solids. Bioinorganic chemistry: reactivity of oxidized metal complexes with nucleic acids, photo-induced DNA cleavage, synthesis and characterization of model complexes for metalloenzymes.

**Organic.** Synthesis and biological reactions of natural products; peptide synthesis; protein engineering; structure-function studies on polypeptides and proteins; mechanistic and synthetic studies in organometallic chemistry; catalysis using organometallic complexes; nuclear magnetic resonance; kinetics; organosulfur and organophosphorus chemistry; surface effects in chemical behavior; chemistry of reactive intermediates including carbocations, carbanions, carbones and radical pairs; new synthetic methods including asymmetric synthesis; stereochemistry and conformational analysis; design and synthesis of models for metalloenzymes; epr investigations of electronic couplings in high-spin organic molecules; spectroscopic studies of free radicals; synthesis and characterization of well-defined polymeric materials; synthesis of materials for use in microelectronics; homogeneous and heterogeneous polymerizations in supercritical fluids; synthesis of engineering polymers; molecular recognition.

Polymer and Materials Chemistry. Many challenging problems in the modern science and technology are related to preparation, properties, and utilization of novel functional materials. The polymer chemistry and the chemical microelectronics programs represent parts of the multidisciplinary effort in this field. The many-pronged approach includes: synthesis and molecular characterization of well-defined block and graft copolymers; preparation of new engineering thermoplastics and liquid crystalline materials; synthesis, modification and processing of polymers in supercritical carbon dioxide; chemical design of hybrid polymers for catalysis and photoredox activity; polymers for microelectronics applications including 193 nm and 157 nm photoresists and low-k dielectrics; and defined microstructures. Chemical microelectronics is focused on preparation of organic and inorganic electronic materials; microscopic patterning of thin films using novel techniques (plasma, ion beam, laser beam, etc.); kinetics of etching and film formation; characterization of mechanical, electronic, and optical properties; spatially resolved chemical analysis of surfaces, interfaces, and thin films and microstructures. A broad variety of expertise includes visualization and probing of submicrometer surface structures by scanning probe microscopy, characterization of polymer dynamics by NMR techniques and light scattering, measurement of molecular conductivity, and analytical as well as computational and numerical methods in polymers.

Biotechnology. The University has instituted a program in Molecular Biology and Biotechnology. This program is an umbrella covering faculty and their research programs located in various departments including Biochemistry and Biophysics, Microbiology, Pathology, Biology, and Chemistry. Some of the research being carried out in this field includes recombinant DNA technology, molecular genetics, atomic force microscopy, protein biosynthesis, enzymology, protein engineering, monoclonal antibodies, protein molecular dynamics, molecular modeling, and site-directed mutagenesis.

Attention is drawn to the possibility of arranging, through consultations with staff of the departments of Chemistry and Physics, a program combining course work in the two departments with thesis research in either department. Such a program would provide training in an area in which methods of theoretical and experimental physics are applied to chemical problems.

Facilities and Equipment

Research is carried out in the William Rand Kenan Jr. Laboratories, a facility of 180,000 square feet completed in 1971. Additional space of approximately the same size is used in the historic and renovated Venable Laboratories, while undergraduate laboratories are housed in the modern John Morley Morehead Laboratories completed in 1986. Construction will begin in 2003 of Phase 1 of a multiphase project to replace Venable and provide increased laboratory space. The new laboratory space will ultimately exceed the combined size of Kenan and Venable Laboratories. Included in the department are some major facilities managed by Ph.D.-level staff scientists. The NMR laboratory includes 7 high resolution FT-NMR spectrometers ranging from 200 to 600 MHz for liquids: 200 MHz, 300 MHz, two 400 MHz and 500 MHz Bruker spectrometers, and 300 MHz and 600 MHz Varian spectrometers. There is also a Bruker 360 MHz wide bore FT-NMR spectrometer suitable for solid polymeric samples with magic angle spinning. The protein synthesis laboratory is a joint facility in conjunction with NIEHS in the Research Triangle Park. In addition, the department houses an ESCA instrument, various UV-visible spectrometers, EPR, and FT-IR spectrometers, an Aviv circular dichroism spectrometer, mass spectrometers, and magnetic susceptibility equipment as well as an automated X-ray facility that houses two single crystal Rigaku diffractometers.

Computing services are among the most important for modern research. The University facilities include a 46 processor SGI cluster (400MHz), a 36 processor SUN E10000 system, and a 4 processor SUN E450 system. These are dedicated broadly to scientific computing. Local Ethernets and a campus-wide broadband network link all parts of the campus. There are also links to the North Carolina Supercomputer Center, which houses an IBM cluster of power 3 processors (180 nodes of 4 processors each) and an SGI cluster of 48 processors (600 MHz). A number of the individual laboratories in chemistry own Silicon Graphics workstations. In addition, UNC-Chapel Hill has a major molecular modeling laboratory located in the Department of Medicinal Chemistry and a world-renowned graphics facility housed in the Department of Computer Science.

To support the research programs, the department provides a number of services. Machine, glass, and electronics shops are provided to assist in construction and maintenance of specialized equipment. Technicians are also available to run certain specialized instruments.

The William Rand Kenan Jr. Chemistry Library and reading room, conveniently housed in the Venable Laboratories for twenty-four-hour use by research students, contains complete sets of the most important chemical periodicals, many books of reference, on-line literature searching terminals, an extensive collection of monographs, and books of historical value and interest, amounting to more than 45,000 volumes.

Financial Aid and Admission

The department awards a number of industrial fellowships and predoctoral research and teaching appointments. All outstanding prospective graduate students who apply for admission/support are automatically considered for fellowships.
There are approximately 200 graduate students in the department. All are supported either as teaching assistants (64), research assistants (106), or as fellows (30) supported by the Graduate School, industry, or the United States government. The duties of the teaching assistants include preparation and supervision of laboratory classes in undergraduate courses and grading of laboratory reports.

Applications for assistantships and fellowships should be made by January 1, although applicants for assistantships are considered after that date. All applicants (foreign and American) must take the Graduate Record Examination. All foreign students whose native language is not English must take the TOEFL examination in addition to the Graduate Record Examination. Foreign students who hold a degree from a university in the United States are exempt. Both the TOEFL and GRE should be taken as early as possible, preferably in October.

Application forms for admission/support, as well as information about the department, may be obtained from the graduate studies coordinator in Chemistry, e-mail address: kcj@unc.edu.

Courses for Graduates and Advanced Undergraduates

101 SPECIAL PROBLEMS IN CHEMISTRY (1-3). Prerequisite, to be determined by consultation with vice-chair of Undergraduate Studies. Equivalent of one to three hours a week. Fall and spring. Chemistry faculty.

120 POLYMER CHEMISTRY (APPL 120) (3). Prerequisite, Chemistry 61 or 65H; prerequisites or corequisites, Chemistry 62 or 66H, 62L or 66L. Introduction to polymer chemistry; synthesis and reactions of polymers; thermodynamics and kinetics of polymerization; physical characterization of polymers; industrial uses of polymers. Fall. Organic and Physical Chemistry faculty.


123 INTERMEDIATE POLYMER CHEMISTRY (3). Prerequisite, Chemistry 122. Rheology and mechanical properties of polymers: plastics, fiber, and elastomer technology. Spring. Chemistry faculty and staff.

124 POLYMER CHEMISTRY LABORATORY (APPL 124L) (2). Prerequisite or corequisite, Chemistry 120 or 121. Thermal analysis; solution viscosity; gel permeation chromatography; end group analysis; synthesis; characterization of an unknown polymer. One four-hour laboratory a week and one hour lecture each week. Spring. Chemistry faculty and staff.

130 INTRODUCTION TO BIOLOGICAL CHEMISTRY (Biology 130) (3). Prerequisites, Chemistry 62 or 66H, 62L or 66L; Biology 11. The study of cellular processes including catalysis, metabolism, bioenergetics, and biochemical genetics. The structure and function of biological macromolecules involved in these processes is emphasised. Fall and spring. Biological Chemistry faculty.

131 NUCLEIC ACID CHEMISTRY (Biotechnology 131) (3). Prerequisites, Chemistry 130, Biology 50. Study of reactions and chemical properties basic to nucleic acids; chemical synthesis as well as biosynthesis; nucleic acids in protein biosynthesis. Spring. Biological Chemistry faculty.

132 PROTEIN CHEMISTRY (3). Prerequisite, Chemistry 130. Structural properties of proteins; active-site chemistry; chemical modification of proteins; metalloproteins; coenzyme-enzyme interactions; organization of enzyme systems. Fall. Biological Chemistry faculty.

133 ENZYME MECHANISMS AND KINETICS (3). Prerequisite, Chemistry 132. A detailed discussion of enzyme catalysis; principles of catalysis; enzyme kinetics; the active site of enzymes; allosteric interactions between subunits; the mechanism of coenzyme-catalyzed reactions. Spring. Biological Chemistry faculty.

135 PHYSICAL CHEMISTRY OF BIOLOGICAL MACROMOLECULES (3). Prerequisites, Chemistry 130, 181, and 182. Structure of proteins, nucleic acids and lipids. Structural transitions and intermolecular interactions. Properties of macromolecular assemblies. Techniques for the study of structure and function-optical spectroscopy; magnetic resonance; hydrodynamics; scattering, diffraction. Fall. Physical Chemistry faculty.

136 LABORATORY TECHNIQUES FOR BIOCHEMISTRY (3). Prerequisite, Chemistry 130. An introduction to important chemical techniques and research procedures in the fields of protein and nucleic acid chemistry. Two four-hour laboratories a week, and a one-hour lecture each week. Biological Chemistry faculty.

137 MEMBRANE CHEMISTRY (Biotechnology 137) (3). Prerequisites, Biology 11, Chemistry 130; corequisite or prerequisite, Chemistry 180 or 181. The structure and properties of synthetic membranes and of naturally occurring biological membranes. Spring. Biological Chemistry faculty.

138 CHEMISTRY OF METABOLIC REGULATION (3). Prerequisites, Chemistry 130, 180 or 181. Energy metabolism and its regulation, nitrogen metabolism, biosynthesis of amino acids, fatty acid metabolism. Fall. Biological Chemistry faculty.

140 ANALYTICAL METHODS (2). Prerequisites, Chemistry 41 or 45H, 62 or 66H, 62L or 66L. Analytical separations, chromatographic methods, spectrophotometry, acid-base equilibria and titrations, fundamentals of electrochemistry. Fall. Analytical Chemistry faculty.

141 INTERMEDIATE ANALYTICAL CHEMISTRY (2). Prerequisites, Chemistry 41 or 45H, 41L or 4SL, 62 or 66H, and 180 or 181. Spectroscopy, electroanalytical chemistry, chromatography, thermal methods of analysis and signal processing. Spring. Analytical Chemistry faculty.

141L INTERMEDIATE ANALYTICAL CHEMISTRY LABORATORY (2). Corequisite, Chemistry 141. Experiments in spectroscopy, electroanalytical chemistry, chromatography, thermal methods of analysis and signal processing. One four-hour laboratory a week and one-hour lecture each week. Spring. Analytical Chemistry faculty and staff. (Fee required.)

142 ANALYTICAL RESEARCH TECHNIQUES (2). Prerequisite, Chemistry 180 or 182. Introduction to chemical instrumentation including digital and analog electronics, computer interfacing, and computer techniques. Two one-hour lectures a week. Fall. Analytical Chemistry faculty.

142L LABORATORY IN ANALYTICAL RESEARCH TECHNIQUES (2). Prerequisite, Chemistry 180 or 182; corequisite, Chemistry 142. Experiments in digital and analog instrumentation, computers, interfacing and chemometrics, with applications to chemical instrumentation. One four-hour laboratory a week. Fall. Analytical Chemistry faculty.

144 SEPARATIONS (2). Prerequisites, Chemistry 141 and 180 or 181. Theory and applications of equilibrium and nonequilibrium separation techniques. Extraction, countercurrent distribution, gas chromatography, column and plane chromatographic techniques, electrophoresis, ultra-centrifugation, and other separation methods. Fall or spring. Analytical Chemistry faculty.

145 ELECTROANALYTICAL CHEMISTRY (3). Prerequisite, Chemistry 180 or 181. Basic principles of electrochemical reactors, electroanalytical voltammetry as applied to analysis and the chemistry of heterogeneous electron transfer, analog electronics, and electrochemical instrumentations. Fall or spring. Analytical Chemistry faculty.

146 ANALYTICAL SPECTROSCOPY (3). Prerequisite, Chemistry 180 or 182. Fundamentals of interactions of electromagnetic radiation with matter, vibrational, electronic, nuclear magnetic, mass spectrometry, scattering-based spectroscopy, instrumentation and signal processing. Fall or spring. Analytical Chemistry faculty.
147 ANALYTICAL SPECTROSCOPY II (2). Prerequisite, Chemistry 180 or 182. Principles and applications of X-ray absorption and emission, photoelectron, Raman, gamma-ray, Mossbauer and internal reflection spectroscopy, nuclear quadrupole and electron spin resonance, fluorescence, optical rotatory dispersion and circular dichroism, secondary emission methods. Fall or spring. Analytical Chemistry faculty.

148 MASS SPECTROMETRY (2). Prerequisite, Chemistry 180 or 181. Fundamental theory of gaseous ion chemistry, instrumentation, combination with separation techniques, spectral interpretation for organic compounds, applications to biochemical and environmental chemistry. Fall or spring. Chemistry faculty.

150 INTERMEDIATE INORGANIC CHEMISTRY (3). Prerequisite, Chemistry 51. Electronic states of transition metal ions, symmetry labels, ligand field theory and angular overlap model for coordination complexes, kinetics and mechanisms of transition metal reactions, organo-metallic chemistry, biomimetic chemistry. Fall. Inorganic Chemistry faculty.

151 THEORETICAL INORGANIC CHEMISTRY (1-3). Prerequisites, Chemistry 51, 62 or 66H. Chemical applications of symmetry and group theory, crystal field theory, molecular orbital theory. The first third of the course, corresponding to one credit hour, covers point symmetry, group theoretical foundations, and character tables. Fall. Inorganic Chemistry faculty.

152 ELECTRONIC STRUCTURE OF TRANSITION METAL COMPLEXES (3). Prerequisite, Chemistry 151. A detailed discussion of ligand field theory and the techniques that rely on the theoretical development of ligand field theory, including electronic spectroscopy, electron paramagnetic resonance spectroscopy, and magnetism. Spring. Inorganic Chemistry faculty.

153 PHYSICAL METHODS IN INORGANIC CHEMISTRY (3). Prerequisite, Chemistry 151. Introduction to the physical techniques used for the characterization and study of inorganic compounds. Topics typically include vibrational spectroscopy, nuclear diffraction, Mossbauer spectroscopy, X-ray photoelectron spectroscopy, and inorganic electrochemistry. Spring. Inorganic Chemistry faculty.


166 ADVANCED ORGANIC CHEMISTRY I (3). Prerequisite, Chemistry 62 or 66H; prerequisites or corequisites, Chemistry 150, 181. A survey of fundamental organic reactions including substitutions, additions, eliminations, and rearrangements; static and dynamic stereochemistry; conformational analysis; molecular orbital concepts and orbital symmetry. Fall. Organic Chemistry faculty.

167 ADVANCED ORGANIC CHEMISTRY II (2). Prerequisite, Chemistry 166. Spectroscopic methods of analysis with emphasis on elucidation of the structure of organic molecules: 1H and 13C NMR, infrared, ultraviolet, ORD-CD, mass and photo-electron spectroscopy. Chemistry 166 and 167 may not both be taken for academic credit. Spring. Organic Chemistry faculty.


170L SYNTHETIC CHEMISTRY LABORATORY I (2). Prerequisites, Chemistry 41L or 45L, 51, 62L or 66L. A laboratory devoted to synthesis and characterization of inorganic complexes and materials. A four-hour synthesis laboratory, a characterization laboratory outside of the regular laboratory period, and a one-hour recitation each week. Fall. Chemistry faculty and staff.

171L SYNTHETIC CHEMISTRY LABORATORY II (2). Prerequisite, Chemistry 170L. An advanced synthesis laboratory focused on topics in organic chemistry. A four-hour synthesis laboratory, a characterization laboratory outside of the regular laboratory period, and a one-hour recitation each week. Spring. Chemistry faculty and staff.

175 MECHANISMS OF ORGANIC AND INORGANIC REACTIONS (4). Prerequisite, Chemistry 150. Kinetics and thermodynamics; free energy relations; isotope effects; acidity and basicity; kinetics and mechanisms of substitution reactions; one- and two-electron transfer processes; principles and applications of photochemistry, organometallic reaction mechanisms. Fall. Inorganic and Organic Chemistry faculty.

180 INTRODUCTION TO BIOPHYSICAL CHEMISTRY (3). Prerequisites, Chemistry 61 or 65H; Physics 25, Math 32. Does not carry credit toward graduate work in Chemistry or credit toward any track of the B.S. degree in Chemistry. Application of thermodynamics to biochemical processes; enzyme kinetics; properties of biopolymers in solution. Fall. Physical Chemistry faculty.

181 PHYSICAL CHEMISTRY I (3). Prerequisites, Chemistry 21 or 25H; Physics 26, 27; and pre- or corequisite, Math 83, 58, or 61. Thermodynamics, kinetic theory, chemical kinetics. Fall. Physical Chemistry faculty.

181L PHYSICAL CHEMISTRY LABORATORY I (2). Prerequisite or corequisite, Chemistry 181. Experiments in physical chemistry. One three-hour laboratory and a single one-hour lecture a week. Fall. Physical Chemistry faculty and staff.

182 PHYSICAL CHEMISTRY II (3). Prerequisite, Chemistry 181. Introduction to quantum mechanics, atomic and molecular structure, spectroscopy, statistical mechanics. Spring. Physical Chemistry faculty.

182L PHYSICAL CHEMISTRY LABORATORY II (2). Prerequisites, Chemistry 181, 181L; prerequisite or corequisite, Chemistry 182. Experiments in physical chemistry. One four-hour laboratory a week. Spring. Physical Chemistry faculty and staff.

184 THERMODYNAMICS AND INTRODUCTION TO STATISTICAL THERMODYNAMICS (1-3). Prerequisite, Chemistry 182. Thermodynamics, followed by an introduction to the classical and quantum statistical mechanics and their application to simple systems. The section on thermodynamics can be taken separately for one hour credit. Fall. Physical Chemistry faculty.

185 CHEMICAL DYNAMICS (3). Prerequisites, Chemistry 181, 182. Experimental and theoretical aspects of atomic and molecular reaction dynamics. Fall or spring. Physical Chemistry faculty.

186 INTRODUCTION TO QUANTUM CHEMISTRY (3). Prerequisites, Chemistry 181, 182. Introduction to the principles of quantum mechanics. Approximation methods; angular momentum; simple atoms and molecules. Fall. Physical Chemistry faculty.

187 INTRODUCTION TO MOLECULAR SPECTROSCOPY (3). Prerequisite, Chemistry 186. Interaction of radiation with matter; selection rules; rotational, vibrational, and electronic spectra of molecules; laser-based spectroscopy and nonlinear optical effects. Fall or spring. Physical Chemistry faculty.

188 QUANTUM CHEMISTRY (3). Prerequisite, Chemistry 186. Applications of quantum mechanics to chemistry. Molecular structure, time-dependent perturbation theory; interaction of radiation with matter. Spring. Physical Chemistry faculty.

189 STATISTICAL MECHANICS (3). Prerequisite, Chemistry 184. Applications of statistical mechanics to chemistry. Ensemble formalism; condensed phases; nonequilibrium processes. Spring. Physical Chemistry faculty.

190 FUNDAMENTALS OF MATERIALS SCIENCE (Applied Sciences 141) (3). Prerequisite, Chemistry 182; or prerequisite, Physics 28 and prerequisite or corequisite, Physics 105. Crystal geometry; diffusion in solids; mechanical properties of solids; electrical conduction in solids; thermal properties of materials; phase equilibria. Fall. Irene.

191 MATHEMATICAL TECHNIQUES FOR CHEMISTS (3). Prerequisites, knowledge of differential and integral calculus. Chemical applications of higher mathematics. Fall. Chemistry faculty.

192 CHEMISTRY AND PHYSICS OF ELECTRONIC MATERIALS PROCESSING (Physics 144, Applied Sciences 142) (3). Prerequisite, Chemistry 182, or Physics 25 or 27, and permission of the instructor. A survey of materials processing and characterization used in fabricating microelectronics devices. Crystal growth,
193 CHEMISTRY AND PHYSICS OF SURFACES (Applied Sciences 143) (3). Prerequisite, Chemistry 190. The structural and energetic nature of surface states and sites; experimental surface measurements; reactions on surfaces including bonding to surfaces and adsorption; interfaces. Spring. Irene, Jarnagin.

Courses for Graduates
231, 232 SEMINAR IN BIOLOGICAL CHEMISTRY (2 each). Prerequisite, graduate standing. Literature survey dealing with topics in protein chemistry and nucleic acid chemistry. Fall and spring. Biological Chemistry faculty.

233 SPECIAL TOPICS IN BIOLOGICAL CHEMISTRY (1-3). Modern topics in biological chemistry. Fall and spring. Biological Chemistry faculty.

234 SPECIAL TOPICS IN BIOLOGICAL CHEMISTRY: NMR (1-3). Introduction to practical solution NMR of proteins in solution. Fall, spring. Plelak.

235 SPECIAL TOPICS IN BIOLOGICAL CHEMISTRY: MACROMOLECULAR INTERACTIONS (1-3). Fall, spring. Plelak.

236 MACROMOLECULAR CRYSTALLOGRAPHIC METHODS (2). Data collection, phase determination, and structural refinement. Laboratory component allows students to crystallize protein, collect and process data, determine phases, and refine their structures. Spring. Redinbo.

242, 243 LITERATURE SEMINAR IN ANALYTICAL CHEMISTRY (2 each). 242 given in fall; 243 given in spring. Analytical Chemistry faculty.

244, 245 SPECIAL TOPICS IN ANALYTICAL CHEMISTRY (1-2). Modern topics in analytical chemistry, including advanced electroanalytical chemistry, advanced mass spectrometry, chemical instrumentation, and other subjects of recent significance. Two lecture hours a week. Fall and spring. Analytical Chemistry faculty.

252 SPECIAL TOPICS IN INORGANIC CHEMISTRY (1-3). Prerequisite, permission of the instructor. Research-level survey of topics in inorganic chemistry and related areas. Fall and spring. Inorganic Chemistry faculty.

254 LITERATURE SEMINAR IN INORGANIC CHEMISTRY (2). Prerequisite, graduate status. Fall and spring. Inorganic Chemistry faculty.

258 X-RAY STRUCTURE DETERMINATION (3). Prerequisite, permission of the instructor; a knowledge of elementary and differential calculus is assumed. This course is designed to introduce students to the techniques used in solving crystal structures by X-ray diffraction. Three lecture hours a week. Fall. Inorganic Chemistry faculty.

261, 262 SEMINAR IN ORGANIC CHEMISTRY (2 each). Prerequisite, graduate standing. One afternoon meeting a week and individual consultation with the professor in charge. Fall and spring. Organic Chemistry faculty.

264, 265 SPECIAL TOPICS IN ORGANIC CHEMISTRY (1-3 each). Two lecture hours a week. Fall and spring. Organic Chemistry faculty.

267 ORGANIC CHEMISTRY (2 to 6). Prerequisite, to be determined by consultation with professor in charge. Three to six hours a week. Fall and spring. Organic Chemistry faculty.

281, 282 SEMINAR IN PHYSICAL CHEMISTRY (2 each). Prerequisite, graduate standing. Two hours a week. Fall and spring. Physical Chemistry faculty.

283, 286 SPECIAL TOPICS IN PHYSICAL CHEMISTRY (1-3 each). Prerequisite, permission of the instructor. Modern topics in physical chemistry, chemical physics, or biophysical chemistry. One to three lecture hours a week. Fall and spring. Physical Chemistry faculty.

288, 289 PRINCIPLES OF CHEMICAL PHYSICS (3 each). Prerequisite, Chemistry 281 or Physics 160 or permission of the instructor. The quantum mechanics of molecules and their aggregates. Atomic orbitals, Hartree-Fock methods for atoms and molecules.

Research Courses
331 RESEARCH METHODOLOGY AND SEMINAR IN BIOLOGICAL CHEMISTRY (1 or more). Seminar and directed study on research methods of biological chemistry. This course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Biological Chemistry faculty.

341 RESEARCH METHODOLOGY AND SEMINAR IN ANALYTICAL CHEMISTRY (1 or more). Seminar and directed study on research methods of analytical chemistry. The course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Analytical Chemistry faculty.

351 RESEARCH METHODOLOGY AND SEMINAR IN INORGANIC CHEMISTRY (1 or more). Seminar and directed study on research methods of inorganic chemistry. The course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Inorganic Chemistry faculty.

361 RESEARCH METHODOLOGY AND SEMINAR IN ORGANIC CHEMISTRY (1 or more). Seminar and directed study on research methods of organic chemistry. The course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Organic Chemistry faculty.

381 RESEARCH METHODOLOGY AND SEMINAR IN PHYSICAL CHEMISTRY (1 or more). Seminar and directed study on research methods of physical chemistry. The course provides a foundation for master's thesis or doctoral dissertation research. Fall and spring. Physical Chemistry faculty.

392 MASTER'S NON-THESIS (Hours vary). 393 MASTER'S THESIS (Hours vary). Prerequisites, Chemistry 331, 341, 351, 361, or 381. Fall and spring. Graduate faculty.

394 DOCTORAL DISSERTATION (Hours vary). Prerequisites, Chemistry 331, 341, 351, 361, or 381. Fall and spring. Graduate faculty.

DEPARTMENT OF CITY AND REGIONAL PLANNING
DAVID H. MOREAU, Chair

Professors
Richard N. L. Andrews (37) Environmental Policy
Raymond J. Burby (40) Land Use, Hazard Mitigation, Environmental Planning
David R. Godschalk (11) Land Use Policy, Dispute Resolution, Growth Management
Harvey A. Goldstein (36), Planning Theory, Economic Development, Research Methods
Edward J. Kaiser (5) Urban Development Processes, Land Use Planning, Hazard Mitigation
Linda Lacey (32) Planning Methods, Demographic Analysis, International Planning
Emil E. Malizia (12) Economic and Real Estate Development; Development Finance
David H. Moreau (10) Environmental Planning, Water Resources Planning, Systems Analysis
William M. Rohe (12) Social Behavioral Aspects of Urban Development, Neighborhood Planning and Development
Dale Whittington (29) Environmental Planning, Public Investment Theory, International Planning

Associate Professors
Philip R. Berke (52) Environmental Planning, Land Use Policy, Natural Hazards Mitigation
Asad Khattak (54) Transportation, Quantitative Analysis

Assistant Professors
Edward Feser (55) Economic Development
Roberto Quercia (57) Housing Finance, Housing Policy
Rhonda Rynar (58) Geographic Information Systems, Environmental Planning
Meenu Tewari (59) Microeconomics, International Planning
Daniel Rodriguez (60) Transportation, Spatial Structure
Research Professor
David J. Brower (34) Growth Management, Coastal Planning, Hazard Mitigation

Adjunct Professors
Edward M. Bergman (14) Economic Development
C. Gorman Gilbert (16) Transportation Planning
Jonathan B. Howe (44) Planning and Government
Michael I. Luger (38) Urban and Regional Economics and Development, Public Policy Analysis, Infrastructure and Housing
Michael A. Stigman (6) Housing and Policy Development, Real Estate Development

Associated Faculty
Richard E. Bilaborow, Developing Countries
Milton S. Heath Jr., Natural Resource Law
David J. Harrrell, Real Estate Development
Dennis A. Randinelli, Developing Countries
Judith W. Wegner, Land Use and Local Government Law

Professors Emeriti
F. Stuart Chapin Jr.
Maynard M. Hafschmidt
John A. Parker
Shirley F. Weiss

City and Regional Planning

The state of North Carolina, the Research Triangle region, and the community of Chapel Hill are ideally suited to serve as the home base of a nationally ranked program in city and regional planning. The UNC-Chapel Hill campus is thirty miles west of Raleigh, the state capital and location of many agencies of state government. Through research projects, internships, and workshop courses, faculty and students interact with agencies such as the departments of Natural Resources and Community Development, Labor, and Transportation, the Board of Science and Technology, and the North Carolina Housing Finance Agency.

The fifty-six-hundred-acre Research Triangle Park, which boasts forty large research facilities employing more than thirty thousand people, is only ten miles from campus. The park, which symbolizes the style of high-tech economic development emerging in many growing regions in the United States, is the engine that drives the area’s rapid growth. The Raleigh/Durham metropolitan area, of which Research Triangle Park and Chapel Hill are part, was identified as one of thirty metropolitan areas in the country that accounted for half the new jobs in the nation in the year 2000. North Carolina, the nation’s tenth most populous state, is growing by about 1.5 percent a year. The Research Triangle area is growing three times as fast. The future urbanization patterns of other areas are evident in the Research Triangle area.

The Department of City and Regional Planning at The University of North Carolina at Chapel Hill was established in 1946. It was among the first seven planning education programs in the United States. The original bases of the department and its program were ideas about regionalism, broad-scale development planning, and the application of social science methods to practical problems of government being explored on the Chapel Hill campus in the 1930s and 1940s. This was the first planning department to be established with its principal university base in the social sciences rather than in landscape design, architecture, or engineering. The department has retained and strengthened that social science legacy through its faculty’s multidisciplinary research and teaching programs.

At the start of the program in 1946, planning was defined as “the union of modern social science, design and engineering. It utilizes social science techniques to analyze the adjustments between people and their physical environment, and adjustments among people in their efforts to meet human needs. Through the planning process ways and means of meeting these needs are developed through social organization and the application of design and engineering techniques...”

From an original concern for applications of social science to regional development needs, the department has broadened its scope to include urban, state, and community planning and to cover physical, social, economic, and natural environmental concerns. The implementation and management aspects of planning—carrying out public policy through programs, projects, budgeting and finance, regulatory controls, and other actions—are also emphasized.

The concept of development as a goal of planning remains central to the department’s mission. Whether the objectives are improved physical, social, economic, or environmental conditions or more efficient and equitable policies and programs, planning is a way to effectively marshal resources to achieve public development objectives. The professional planner combines an understanding of urban and regional theory grounded in a spatial context with a grasp of the planning and management methods necessary to guide development toward desired goals. These skills take on added importance during the 1990s with the emergence of expanded state and local responsibilities and increased public-private development ventures.

Graduates of the program apply their professional knowledge as local and regional planners, private consultants, public interest group staff members, non-profit development organization planners, and state and federal government officials. To be an effective professional in these varying contexts requires a continuously updated knowledge base; therefore the practitioner must be supported by active researchers. Thus, the overall mission of the department is twofold: to educate practitioners and researchers capable of leadership in planning, and to expand the frontiers of knowledge about the effects of public and private actions on development processes through faculty research and service.

Degrees Offered

The department offers two degrees: the Master of Regional Planning and the Doctor of Philosophy in Planning. The two-year master’s degree program prepares students for the professional practice of planning. The Ph.D. program prepares students for careers in research and university teaching in planning. The requirements of the two programs are described in detail in subsequent sections of the catalog. The two graduate degree programs are largely independent. Applicants should indicate which program they wish to enter.

Facilities and Equipment

The Department of City and Regional Planning is housed in New East and maintains laboratory space in Hanes Hall. New East contains microcomputer laboratories, lecture and seminar rooms, offices, and the F. Stuart Chapin Jr. research library containing books, periodicals, pamphlets, reports, and maps used in the study of planning.

The Chapin Library, with some fourteen thousand books, fifteen hundred bound volumes, and eighty-eight hundred planning documents, is one of the outstanding planning research collections in the country. The facilities and services of all university libraries and those of other Triangle universities are available to students enrolled in the Department of City and Regional Planning. (Web: www.lib.unc.edu).

Mainframe and additional microcomputer facilities are available to students through the Institute for Research in Social Science and through the UNC-Chapel Hill Computation Center.
Students in the Department

During the past fifty years students have entered the department from all parts of the United States, Canada, and many other countries. The educational backgrounds of alumni who now hold positions of responsibility in the profession cover a wide range of undergraduate fields. Among them are architecture, biology, botany, business, economics, engineering, forestry, geography, history, landscape architecture, philosophy, political science, public policy analysis, psychology, public administration, sociology, and urban studies.

Graduates hold positions as directors of planning in the planning departments of small and large cities and as directors of state and regional planning programs. Graduates work as associate and assistant planners in city, county, metropolitan, and regional planning agencies, in housing and urban development agencies, in various branches of the federal service, in community-based organizations and associations, in research organizations, and in private development firms and banks. Finally, graduates are employed as private consultants; planning advisers to communities and developing areas; and as deans, chairs, and faculty members of educational institutions.

The Planning Profession and Employment Opportunities

During the past twenty-five years the field of planning has expanded considerably. The planning function is a central part of municipal, county, and state government. Planning agencies operate within the framework of metropolitan, regional, and national governmental programs. In addition, planning expertise has become essential in non-profit and community-based development organizations, consulting firms, advocacy groups, and other private organizations.

This period of increasing planning activity has broadened the scope of planning. In addition to design, research, and analysis, present-day planning functions include program management and implementation activities within public agencies and private organizations as well as coordination between government and business. Planners are increasingly called upon to lead policy analysis teams, to mediate conflicts, to advise decision makers of project impacts, and to package development proposals.

Employment opportunities in planning are varied. In general the work involves collection and processing of data; physical, environmental, and socioeconomic analysis; the preparation and evaluation of alternative proposals; and the formulation and implementation of programs for action.

As a consequence of the growth of planning activities throughout the world, adequately trained and qualified members of the profession are in demand in this country and abroad.

Equally important to the advancement of the field is the increasing need for advancing theory and knowledge in urban and regional development and for motivated teachers of planning. There has been a steady increasing demand for teachers and researchers among universities and research organizations in the United States, Canada, and overseas.

Together with the faculty, hundreds of the department's seventeen hundred alumni in all parts of the country form an effective job referral and placement network for new and old graduates alike. Large numbers of our graduates in such key metropolitan centers as Boston, New York, Washington, Atlanta, Orlando, Miami, Chicago, and on the West Coast provide invaluable assistance to students in their initial job searches and throughout their professional careers. Alumni keep in touch with the department and each other through the Annual Alumni Newsletter, which the department publishes and distributes to all graduates.

Application and Admission

Applications for admission in the fall semester are received and reviewed throughout the year. However, applications must be received in Chapel Hill by January 1 for consideration for University fellowships and first consideration for departmental fellowships, assistantships, and other financial aid. Late applications are processed and admissions granted on a space-available basis. Decisions on admissions and financial aid are made beginning in late February, and all decisions are generally completed by May 15.

Forms and instructions for application are available on the Web (www.unc.edu/depts/dcpweb) or are mailed by the department upon request. Each applicant is required to pay a nonrefundable $55 fee when submitting an application.

Applicants are advised to apply for admission as early as possible. Those who are able to visit the department for personal interviews are invited to do so. The Open House Weekend, hosted by the department each March, provides applicants an opportunity to discuss their professional interests with faculty and enrolled students.

Admission Requirements

All students entering the department must have received a bachelor's degree from an institution of recognized standing. While the design professions, the social sciences, and engineering are clearly relevant undergraduate backgrounds for planning, the field increasingly needs people prepared in the humanities, natural sciences, and business administration, as well as in other fields.

Applicants are required to take the Graduate Record Examination (GRE). This examination, which should be taken as early as possible, is administered in conveniently located centers throughout the United States and in many other countries. To be eligible to take the examination, the candidate must have an application accompanied by the appropriate fee on file approximately fifteen days in advance of the scheduled date of the examination. An information bulletin may be obtained from most colleges and universities or by writing to Graduate Record Examinations, CN 6000, Princeton, NJ 08541-6000. GRE scores are recognized as contributory, not determinative, evidence of the applicant's qualifications.

Admission Decisions

The Graduate School makes admissions decisions on the basis of recommendations submitted by the department. In making admissions recommendations, a student-faculty committee reviews all applicants in terms of established department policy. The major criteria are the applicant's preparation for graduate professional education as indicated by the personal statement of interest in planning filed with the application, academic preparation as indicated by the undergraduate transcript and the GRE, and personal recommendations from teachers and employers.

In addition, the department seeks to have students from a variety of academic and geographical backgrounds and seeks a reasonable balance of students across its primary areas of specialization to make good use of faculty resources. Although previous professional or preprofessional work experience in planning or a related field is not required, such experience is considered in admission decisions. Generally, a substantial part of each class has planning-related or other work experience.

The department has a strong commitment to providing increased opportunities for minorities and persons from disadvantaged backgrounds to enter the planning profession and actively encourages admission of racial minorities.

Transfer Credit

Students desiring to transfer to Chapel Hill from another graduate planning program may do so if they meet the admission requirements. Courses submitted for transfer must be reviewed and approved by this faculty. The
maximum credit that may be transferred from another program is nine
semester hours for the master's degree.

Similarly, students wishing to transfer nonplanning graduate course work
taken elsewhere may do so up to a maximum of nine semester credit hours,
provided that the courses were not credited to another degree and that the
courses are judged by the department to be appropriate to the elective
requirements of the student's program at Chapel Hill. Graduate courses
taken as an undergraduate are not transferable.

A minimum of three semesters in residence is required.

The Professional Master's Degree Program

The program leading to the degree of master of Regional Planning prepares
the candidate for professional planning practice. The curriculum covers social
and institutional problems and settings and planning and management skills.

Satisfaction completion of the degree requires completion of a minimum
of fifty-one credit hours, including an area of specialization and a master's
project in that area. The normal course load is twelve to fifteen credit hours
per semester. Thirty-nine of the required fifty-one credits must be taken in
the Planning Department.

Course work for the degree is divided into general requirements, area of
specialization, and electives. Each student is assisted by a faculty adviser in
designing an educational program. The adviser helps select courses appro
priate for the student's educational interests and goals.

General Course Requirements

All master's degree students are expected to meet certain general course
requirements. These consist of courses covering planning theory, urban spac
tial theory, applied microeconomics, analytical methods, communications
skills, planning law, and a planning workshop. These basic course topics
constitute a core of knowledge and skills prerequisite to completion of the
master's degree program.

The planning theory requirement is met by completing Planning 204. The
analytical and communications methods requirement is met by completing
Planning 130 and 131. Planning 214 fulfills the spatial theory requirement.
The economics requirement is met by completing Planning 210. Students
select a planning workshop (Planning 222 or 223) during their second year
and a planning law course appropriate for their specialization.

Areas of Specialization

Each student develops an area of specialization in Planning in consultation
with faculty advisers. The area of specialization identifies the fields of pro
fessional practice in which the student expects to develop competence and
begin a professional career.

Areas of specialization offered by the department reflect a combination of
current practice, employment opportunities, available faculty resources, and
longer-term societal needs. As these factors change, specialization content is
adjusted. Specialization offers different blends of technical knowledge, plan
ning and management skills, philosophies about the role of the planner,
and theories for understanding relevant problems and contexts.

Each student selects an area of specialization from one of three focus
areas. Each focus area has its own required courses designed to help stu
dents develop the special competence with which to begin their careers.

Economic Development builds on social, political, economic, and spatial
theories of industrial, enterprise, labor, and social group behavior. The eco
nomical development specialization deals with alternative methods of
planned intervention at scales ranging from the neighborhood to multisite
regions. Local economic development problems and issues, such as central
city decline or unemployment, are approached through practice-based ana-
lytic, program design, and financing methods. Workshops with public, pri
te, nonprofit, or community-based clients afford opportunities to test
economic development strategies. Topics covered include design of sustain
able development and redevelopment plans, strategies, and projects; econ
omic and fiscal impact studies; industrial and occupational forecasting;
industrial, fiscal, employment, and neighborhood development policies;
community, labor market, and site studies; business incubation, expansion,
and revitalization strategies; economic and community adjustment plans;
sources, uses, and instruments of development finance; public-private ven
tures; community and employee ownership; and the spatial dimension of
social and economic change.

Land Use, Transportation, and Environmental Planning focus area aims
toward achievement of smart growth. It prepares students for careers in
planning and management of the physical environment and its sustainable
development. Specialization areas include growth management, environ
mental planning, coastal management, and transportation planning. The
primary focus is the United States state and local context, although the con
cepts also are relevant to national and international contexts. Required
knowledge includes understanding of urban spatial relationships, natural
systems functions, physical resource utilization, urban development process
es, human activities patterns, movement systems, transportation-land use
linkages, and legal/institutional arrangements for government planning,
regulation, and capital investment. Necessary skills include acquisition and
analysis of physical systems information; estimation of impacts from pro
posed projects; preparation of land use, environmental, transportation, and
growth management plans; drafting and administration of development
regulations and capital improvement programs; evaluation of site plans and
project proposals; and communication and policy implementation. These
skills are applied through methods dealing with political and institutional as
well as land use, transportation, and environmental factors at the project,
community, and regional scales.

Housing, Real Estate, and Community Development focus area concentra
tes on the provision of sound affordable housing, the revitalization of
urban neighborhoods, and the development of residential and commercial
real estate that enhances the local community. The focus area prepares stu
dents to work in public or non profit agencies concerned with providing
low income housing and revitalizing urban neighborhoods, or in private
companies involved in developing or financing residential and commercial
real estate. The focus area builds on economic theories of local housing,
land markets, and investment decisions; and on social theories of the struc
ture and function of local communities. The decisions of the various actors
in the development process are analyzed and the changing roles of the pub
lic and private sectors are explored. Students receive training in a variety of
methods for analyzing both public and private investment decisions (e.g.,
real estate investment analysis, project design and evaluation, and economic
and market feasibility studies) and for revitalizing urban neighborhoods
(e.g., community analysis and citizen involvement strategies). Workshops
provide students with an opportunity to apply theory and method to real
world problems.

Students with a special interest in areas of the developing world may take
a formal minor in Planning for Developing Areas in addition to their area
of specialization. The minor is designed to train planners from both indus
trialized and less developed countries to work on management, research,
administrative, and planning issues at the local, regional, and national levels
in developing areas. Theories of economic development, social change,
environmental degradation, and urbanization are presented, as well as ana
lytical tools and quantitative techniques that prepare students to embark on
a variety of careers that meet the needs of donor agencies and governments
in developing countries. Students receive training in development-planning techniques, cost-benefit analysis and project appraisal, project management, and population planning. The minor requires three courses with departmental faculty who teach and work in a developing area, and additional courses are available. The fields of water resources, population, housing, and economic development are emphasized.

Generally, specialization courses account for twelve credit hours. Thus, in a fifty-one credit-hour program, two-thirds of the credits fulfill basic requirements or specialization requirements while one-third are electives chosen by the student in consultation with faculty advisers.

General Electives

Additional courses are required beyond the general required courses and courses in the area of specialization. General electives may be used to complement and support the area of specialization, to specialize in another area of professional planning, to develop skills in a discipline (e.g., economics, design, management) or another professional program represented on campus (e.g., public administration, health administration, environmental engineering, business), or to develop general competence for professional practice through courses selected both within the department and from the regular offerings of the University. Up to twelve credits may be taken outside the department.

**Summary of Course Requirements**

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<tr>
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<th>Total</th>
<th>Must Be in DCRP</th>
<th>May Be Outside of DCRP</th>
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<tr>
<td>Planning Theory</td>
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<td>Electives/Supporting Courses</td>
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<td>3-6</td>
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<td>Master's Project</td>
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*Varies by area of specialization

**Master's Project**

The master's project required of all master's degree students is original work involving substantial independent research and analysis of a topic related to planning practice. The requirement may be met by a paper of standard format. The requirement can also be fulfilled with a product in some other form, such as a plan or audiovisual presentation. Ordinarily, students submit an individually prepared paper. The student submits the paper topic and outline to the director of the student's focus area. The director approves the topic and assigns a faculty member to serve as major adviser for the project. The student may invite another faculty member to serve as a reader. Both must approve the final project. The project is completed during the final semester in residence and is filed by the department as part of the permanent record of the student's work.

Further information about the master's program may be obtained from the program director, Professor Philip Berke.

**The Doctoral Program**

The doctoral program in Planning provides training in research methods, planning theory, and areas of specialization that enable graduates to contribute to the development of substantive theory, knowledge, and scholarship in planning; to formulate and evaluate innovative public policy; and to administer research programs in domestic and international contexts. The program is small but highly selective and individualized. It is ideal for mature students from a variety of backgrounds.

The Ph.D. degree requires a minimum of thirty credits. A master's degree in planning is not required, although most doctoral students have previous graduate work in planning or a related field. Students must fulfill four semesters of residence. The department accepts graduate transfer credits but requires at least one year of continuous residency of at least six semester hours per regular semester. The department does not require a foreign language. It strongly encourages both research and teaching experience during residency.

In practice, doctoral candidates who hold master's degrees in planning or a related field generally require three to four semesters of formal course work in residence before beginning the dissertation. Other candidates may require five or more semesters, depending on their preparation. Dissertation research generally takes one more year.

Each student develops an individualized course of study to reflect a specific area of interest and career aspirations. Areas of specialization and appropriate course work are determined jointly by the student and program advisor. Programs are designed to meet the student's needs and build on prior academic training, for which substantial departmental or University faculty resources are available. Courses in the area of specialization must be mutually reinforcing and coherent; must prepare the student for expertise in some body of knowledge, methodology, or problem area; and must provide the student with the methods and knowledge base to do scholarly research. The comprehensive exams, taken at the end of course work, require a knowledge of planning theory and research methods in addition to the student's specific area of specialization.

A student may take a minor in another discipline with the consultation and approval of the appropriate department and the student's program committee. The minor emphasizes the achievement of methodological and related skills necessary to extend the student's research capabilities within a chosen area of specialization. Supportive complementary relationships between the two program components must be demonstrated.

It is important that the Ph.D. Admissions Committee be able to identify an applicant's program interests from application materials submitted for review to the Graduate School and the department. In addition to any supplemental material the applicant may wish to submit in support of the application, the statement called for in the department's supplemental application should describe the proposed area of concentration and specific program course work and research interests, and information on relevant prior academic and professional training. The admissions process consists of two related phases. First, the Admissions Committee renders judgment about the academic qualifications of the Ph.D. applicant. Second, if academic qualifications are met, the committee attempts to identify the applicant's program interests and the stage of development of those interests, and then considers the extent to which departmental and University-wide resources may be marshaled in support of those stated interests. Thus, academic qualifications are necessary but are not the only basis for admission into the doctoral program. Applicant interests must be clear and University resources must be supportive to ensure the development of a strong Ph.D. program.

Persons wishing to be considered for admission to the doctoral program and for fellowships and assistantships that may be available to doctoral candidates are advised to communicate with the department as far in advance as possible of the date they wish to enter. While the University financial awards are made in the spring semester each year, the deadline for applications for certain fellowships available to Ph.D. candidates is in January preceding the August in which the applicant plans to begin the doctoral program.
Applicants benefit by a visit to the department to discuss program requirements and interests prior to making formal application for admission. Further information about the doctoral program may be obtained from the program director, Professor Harvey Goldstein.

Combined Program in Law and Planning

Under a combined program sponsored by the School of Law and the Department of City and Regional Planning, students may pursue the J.D. and master of Regional Planning degrees together. Taken jointly, the two degrees may be obtained in four years rather than the five years ordinarily required. The combined program seeks to develop professionals capable of dealing with both the legal and planning aspects of urban and regional policy problems. Course work is designed to prepare students for a variety of professional roles in which a knowledge of planning methodology and process, coupled with the analytical skills and professional expertise of the lawyer, are essential. These include administrators and staff of public agencies and consulting firms in the fields of planning, housing, development, and environmental protection and members of private law firms and public legal staffs.

To enter the combined program students must apply separately to both the School of Law and the Department of City and Regional Planning and must be accepted independently by both. Students entering the program spend their entire first year in either the Department of City and Regional Planning or the Law School and must make this choice at the time of admission.

Admission to the Graduate School of Business

Admission is based on demonstrated potential for responsible leadership, the quality of the student's academic transcripts, and the applicant's score on the Graduate Management Admission Test (GMAT) administered by the Educational Testing Service of Princeton, New Jersey.

Further information about the joint degree program in business and planning may be obtained from the program advisers:

Professor Emil E. Malizia, Department of City and Regional Planning
Professor David Hartzell, Kenan-Flagler Business School

Combined Program in Public Administration and Planning

Planners often gravitate to governmental management positions in local and state government, and in any case benefit from knowledge of budgeting, personnel, and government administration and politics. City and county managers must grapple with planning issues, which constitute a large portion of local government agendas. To prepare people who want the flexibility of moving between planning and management positions in government, the department and the Public Administration program in the Department of Political Science collaborate in a program whereby students can receive both the MRP and the MPA degrees in three years, plus a summer professional field experience in public administration.

The intent of the combined program is to ensure that students train in two complete and complementary, but distinct, areas. The MPA requirements ensure adequate training in public management. The MRP requirements ensure adequate training in core planning knowledge and skills, and in an area of planning specialization such as land use and environmental planning, economic development, housing, real estate, or community development.

Students must obtain admission to both the MPA and MRP programs independently. With prior approval from faculty advisers in both programs, students may then count certain courses toward both degrees. The combined program requires a total of seventy-eight semester credit hours.

Further information about the Master of Public Administration program may be obtained from:

Director, Master of Public Administration Program
241 Knapp Building, CB# 3330
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3330
It is also possible for master's students in City and Regional Planning to take a formal minor in Public Policy Analysis within the structure of the MRP curriculum.

**Students in Other Departments**

Students taking degrees in other departments may be admitted to courses in City and Regional Planning provided they have the necessary prerequisite training and permission of the instructor. A limited number of courses are open to undergraduate students and priority is given to students majoring in Public Policy Analysis and those who are in the undergraduate honors program in Urban and Regional Studies. Minor programs for qualified candidates for master's and doctoral degrees in other fields may also be arranged.

**Research Programs in Urban and Regional Studies**

Through the Center for Urban and Regional Studies, the Institute for Research in Social Science, the Water Resources Research Institute, the Institute for Environmental Studies, the Carolina Population Center, and the Institute for Economic Development, members of the faculty and graduate students in the Department of City and Regional Planning and in related departments collaborate on research in a wide range of subject areas concerning planning, human behavior, and the environment.

Established in 1953 and later expanded under a grant from the Ford Foundation, the program of the Center for Urban and Regional Studies is concerned with theoretical and empirical research in urban processes and area development. The center has a permanent staff for planning and administration of its program and for the development of an interdisciplinary research-oriented program of services to local and state governments in North Carolina and elsewhere. The department’s faculty use the center to pursue research interests and collaborate with faculty members of other University departments on research projects.

The Institute for Environmental Studies, established in 1965, provides a means for furthering research and teaching in various fields of environmental quality on an interdisciplinary basis. Members of the department's faculty and graduate students use the institute to participate with other departments in seminars and discussions on broad aspects of environmental quality in the natural and social sciences, in engineering, and in public health.

In 1969 the Water Resources Research Institute was established to support research on all aspects of water resources including the planning, programming, and analysis of urban and regional systems for development and control of quantity and quality of water and related land use. The institute serves as a focal point for faculty and student research and interdisciplinary seminars relating to water resources.

The Carolina Population Center (CPC), established in 1966, provides coordination of the University-wide interdisciplinary program in population research and training. Its efforts span the social, behavioral, and health sciences and it provides research services to faculty doing research in the United States and abroad. Departmental faculty and students are engaged in international research through the CPC.

The Institute for Economic Development was created in 1971 within the Extension Division of the University to sponsor the Basic Economic Development course. Now under the auspices of the Department of City and Regional Planning, the institute promises to strengthen the department’s research and teaching mission and to enlarge its service capacity.

In addition to these activities organized under an institute or center, faculty members are engaged in research projects administered by the department.

Several other facilities in the nearby Research Triangle Park enrich and support the department’s teaching and research programs:

The Research Triangle Institute (RTI) is a not-for-profit corporation that conducts research under contract to departments of federal, state, and local governments, public service agencies, foundations, and industry clients ranging from local firms to national corporations.

The institute was created as a separately operated affiliate of the three major universities that form the Research Triangle. Initial start-up funding for RTI was provided through a grant from the Research Triangle Foundation.

Since research operations began in 1959, RTI has grown to a full-time, permanent staff of approximately 950. Contract revenues exceed $42 million annually.

The institute is organized into major groups whose areas of capability span social and economic systems and human resources, statistical sciences, survey research, chemistry and life sciences, energy, engineering, and environmental sciences.

The Environmental Research Center, U.S. Environmental Protection Agency (EPA), the largest field installation of the United States EPA, was dedicated in December 1971. Today it is an international center of scientific expertise in environmental research.

The Triangle Universities Center for Advanced Studies, Incorporated (TUCASI) represents an additional effort in the Research Triangle of North Carolina to capitalize on the presence in a small radius of three major doctoral-research institutions, their facilities, libraries, and auxiliary resources. TUCASI is a joint activity of The University of North Carolina at Chapel Hill, Duke University in Durham, and North Carolina State University at Raleigh. TUCASI is the parent body that sponsors development of advanced study enterprises on its 120-acre campus within the Research Triangle Park. The center, chartered in 1975, is governed by a board of trustees, representing the constituent universities, the Research Triangle Foundation, and elected members.

The National Humanities Center was the first resident activity on the TUCASI campus. The center opened in 1978 as an institute for advanced study in history, literature, philosophy, and other fields of the humanities. Each year approximately forty-five leading scholars from the United States and other nations come to the center to pursue individual research and engage in interdisciplinary seminars, lectures, and conferences. Their work results in books, articles, and other contributions to learning. Grants from major foundations, corporations, the National Endowment for the Humanities, the Triangle Universities, and individuals support the center’s program funding and administrative costs.

The Microelectronics Center of North Carolina (MCNC) is the second activity to be placed on the TUCASI campus. MCNC, in its own sophisticated design, fabrication, and laboratory building, provides educational and research facilities and services in microelectronics to the Triangle Area universities, UNC Charlotte, NC A&T State University in Greensboro, and the Research Triangle Institute.

The UNC Institute for Transportation Research and Education (ITRE) is a division of The University of North Carolina General Administration. Its responsibilities include facilitation of transportation-related programs throughout the sixteen UNC campuses. Affiliated faculty and staff of ITRE are located on various campuses of the University and at ITRE’s Research Triangle Park facilities. Included among ITRE’s activities are workshops, short courses, research projects, and training programs for transportation professionals throughout North Carolina.

The Highway Safety Research Center (HSRC) is dedicated to improving transportation safety, with a major emphasis on highway safety. The center conducts basic and applied research that increases knowledge and contributes to reducing death, injury, and related societal costs. HSRC works
to translate developed knowledge into practical interventions that can be applied at local, state, national, and international levels. HSRC conducts research in the three major areas of the highway safety problem - the driver/occupant, the vehicle, and the roadway. HSRC produces guidebooks, brochures, how-to manuals, news releases, public service announcements, and newsletters to communicate highway safety information to research colleagues, safety advocates, government officials, and motorists.

Courses for Graduates and Advanced Undergraduates

**110, 111 SELECTED TOPICS IN URBAN STUDIES** (1-3). The functioning of the urban area as a complex system. Analysis of planning and policies aimed at development and change. Fall or spring. Faculty.

**124 URBANIZATION AND PLANNING IN DEVELOPING COUNTRIES** (3). Prerequisite: permission of instructor required for undergraduates. Theories, issues, and planning strategies employed in developing countries. Topics include rapid population growth, squatter settlements, rural-urban inequalities, urban and rural poverty, women in the development process, rural and regional development planning, and national urbanization policies. Fall. Lacey and faculty.

**125 URBAN SERVICES AND INFRASTRUCTURE** (3). Prerequisite: permission of instructor required for undergraduates. Rigorous analysis of the financing, pricing, and public regulation of the public services and facilities provided by local governments. Methods for measuring their impacts, efficiency, and effectiveness. Fall. Faculty.

**126 URBAN TRANSPORTATION PLANNING** (3). Prerequisite: permission of instructor required for undergraduates. Fundamental characteristics of the urban transportation system as a component of urban structure. Methodologies for the analysis of transportation problems, planning urban transportation, and the evaluation of plans. Spring. Khartak.

**127 PUBLIC TRANSPORTATION** (3). Prerequisite: permission of instructor required for undergraduates. Alternative public urban transportation systems including mass transit, innovative transit services, and paratransit, examined from economic, land use, social, technical, and policy perspectives. Spring. Faculty.

**128 TRANSPORTATION POLICY AND PLANNING** (3). Prerequisite: PLAN 126 or permission of the instructor. Examination of active transportation planning and policy questions: land use relationships, modal compatibilities, environmental quality, transportation demand management, paratransit planning, the transportation needs of special populations, and international comparisons. Fall. Khartak.


**130 QUANTITATIVE ANALYSIS FOR PLANNERS** (3). Prerequisite: permission of instructor required for undergraduates. Accessing information from conventional and electronic sources, spatial data acquisition, analysis and mapping. Inferential statistics through multiple regression. Microcomputer laboratory. Fall. Byzar, Khartak.


**141 ECOLOGY AND LAND USE PLANNING** (3). Integration of the structure, function, and change of ecosystems with a land use planning framework. How land use planning accommodates human use and occupancy within ecological limits to sustain long-term natural system integrity. Fall. Berke.

**142 GENDER ISSUES IN PLANNING AND DEVELOPMENT** (WMST 142) (3). Prerequisite: permission of instructor required for undergraduates. Examination of the experience of women in the urban environment and economic development process in the developing world. Fall. Faculty.

**185 AMERICAN ENVIRONMENTAL POLICY** (ENVR 185, PLCY 185) (3). Intensive introduction to environmental management and policy, including environmental and public health risks, policy institutions, processes and instruments, policy analysis, and major elements of American environmental policy. Lectures and case studies. Three lecture hours per week. Andrews.

Courses for Graduates

**200, 201 SPECIAL TOPICS IN PLANNING AND URBANISM** (3). Reading, lectures, and discussions to provide opportunities to develop new concepts and courses in various city and regional planning topics. Fall or spring. Faculty.

**204 THEORY OF PLANNING I** (3). The logic of planning as a professional activity. Critical overview of current process theories leading students to develop a personal philosophy applicable to their work as planners. Fall and spring. Goldstein, Berke, faculty.


**206 INTRODUCTION TO LAW FOR PLANNERS** (3). Governmental institutions, real property, constitutional law, land use law, and environmental law. Fall. Brooker.

**207 PROFESSIONAL COMMUNICATIONS** (Var). Workshop on writing to build personal strength of expression; computer-based graphics; and persuasive oral presentations. Spring. Faculty.

**210A MICROECONOMICS FOR PLANNING AND PUBLIC POLICY ANALYSIS** (Var). Consumer demand, production theory, product and factor markets, monopoly pricing, perfect and imperfect competition. Fall. Tewari, faculty.

**210B INTRODUCTION TO COST-BENEFIT ANALYSIS** (Var). Financial appraisal; applied welfare economics; and cost-benefit analysis. Fall. Whittington.

**210C INTRODUCTION TO LAND, ENVIRONMENTAL, AND RESOURCE ECONOMICS** (Var). Externalities and public goods; economics of zoning; land markets; common property resources; economic tools for environmental protection; non-market valuation methods. Fall. Whittington.

**214 URBAN SPATIAL STRUCTURE** (3). Theories and empirical evidence of the contemporary spatial development of metropolitan areas. Industrial, residential, and commercial location; neighborhood change; the role of technological change and public policies; and normative perspectives. Fall. Fese, faculty.

**219 WATER POLICY IN LESSER DEVELOPED COUNTRIES** (ENVR 219) (3). Multicriteria programming and planning techniques applied to environmental and resource management. Review of selected models on water quantity and quality, air quality, land use, and public facilities location. Fall. Whittington.

**222, 223 PLANNING WORKSHOP** (3). Problem-solving, client-based courses designed to give students experience in applying planning theory and methods to actual problem situations in economic development, housing and community development, real estate, environmental planning, and land use and transportation. Fall or spring. Faculty.

**225 STATE AND LOCAL PUBLIC FINANCE I** (PLCY 225) (3). Prerequisite: PLAN 210 or intermediate microeconomics. Analysis of tools used to finance infrastructure and services essential for economic development, especially by state/local governments. Emphasizes revenue side (taxes, fees, charges) including use of bonds. Includes institutional design and case studies. Spring. Luger.
232 PUBLIC INVESTMENT THEORY (ENVR 282, PLCY 232) (3).
Prerequisite, PLAN 210 or equivalent. Basic theory, process, and techniques of public
investment planning and decision making, involving synthesis of economic,
political, and technological aspects. Theory underlying benefit-cost analysis, adaptation
to a descriptive and normative model for planning public projects and programs. Spring. Whittington.

233 ENVIRONMENTAL LAW (ENVR 283) (3). An examination of the law of
resource use and development, its administration, and underlying policies.
Particular attention is given to water resources law, regulatory law, and natural
resource administration. Fall. Heath.

234 WATER RESOURCES PLANNING AND POLICY ANALYSIS (ENVR 284) (3).
Water resources planning and management. Federal and state water
resources policies. Analytical skills to identify environmental problems associated
with urban water resources development. Fall. Moreau.

236 ENVIRONMENTAL QUALITY MANAGEMENT (ENVR 286) (3).
Planning and analysis of regional environmental system with a focus on management of
mass flows that affect the quality of the regional environment. Spring. Moreau.

237 COASTAL MANAGEMENT POLICY (3). Analysis of national and state
coastal management laws, policies, and programs. Private sector, interest group, govern-
ment agency, and public roles in coastal resource allocation. Influence of science,
values, and politics. Fall. Brower, Owens.

240 LAND USE AND ENVIRONMENTAL POLICY (3). History, institutional
setting, rationale of state and local land use, and environmental policies. Program
and policy frameworks, political and market processes, resource utilization concepts,
and contemporary development and resource management. Fall. Berke.

241 LAND USE AND ENVIRONMENTAL PLANNING (3). Methods of land
use planning. Use of GIS and spreadsheets to analyze land suitability and spatial
needs. Preparation of land classification plans, land use design plans, and develop-

242 PROJECT AND SITE PLANNING (3). Techniques of site analysis, project
programming, and arrangement of structures on the land. Workshop covering
design and review of urban development projects within limitations of regulatory
standards and market criteria. Fall. Godschalk and Rimet.

244 DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT (3).
Coordination of public powers and private actions to implement development plans
and conserve environmental resources. Regulatory, public investment, incentive, and
policy instruments used in land use and environmental guidance systems. Fall. Kaiser.

245 DEVELOPMENT IMPACT ASSESSMENT (3). Methods for data manage-
ment and predictive analysis of the environmental, transportation, and other infra-
structure, fiscal and social impacts of land development projects. Impact mitigation
measures are also examined. Spring. Burby.

246 GIS FOR PLANNERS (3). Applications of GIS to typical planning problems.
Introduction to GIS concepts and issues related to geography, cartography, data man-
agement, spatial analysis, and project planning. Laboratory exercises using ArcInfo,

247 ADVANCED GEOGRAPHIC INFORMATION SYSTEM (3). Prerequisite,
PLAN 246 or equivalent. Advanced class in Geographic Information Systems (GIS)
techniques and analyses providing hands-on development of projects and applica-
tions using methods of analyses for spatial data from planning, public health, and
business. Fall. Ryznar.

251 REAL ESTATE INVESTMENT AND AFFORDABLE HOUSING (3).
Fundamentals and techniques of real estate investment analysis, including cases and
computer modeling: applications of the public interest in private investment deci-
sions; tax and other public policies influencing real estate investments; and afford-
able housing. Spring. Quercia.

252 HOUSING AND PUBLIC POLICY (3). A theory-based course in housing
and market dynamics; the justification for government intervention and the opera-
tions of the mortgage market and construction industry. Students develop skills for
housing market and policy analysis. Fall. Quercia.

253 BETWEEN STATE AND MARKET: HOUSING POLICY IN THE 21ST
CENTURY (PLCY 259) (3). Prerequisite, PLAN 251 or permission of instructor.
The course objective is to design the next generation of low income housing policies
that "get the incentives right," and to address the inherent tensions between the
"state" and the market. Spring. Stegman.

254 DEVELOPMENT DISPUTE RESOLUTION (3). Contemporary methods
of resolving development disputes through negotiation, bargaining, and mediation.
Techniques and skills applicable to solving controversies over planning and imple-
mentation of public and private development projects. Fall. Godschalk.

255 THE DEVELOPMENT PROCESS (3). The dynamics of real property de-
velopment from the developer's perspective covering market research, government rela-
tions, site planning, financing, investment analysis, construction, and project man-
age, and marketing. Spring. Malizia.

257 PLANNING FOR HISTORICAL PRESERVATION (3). Concepts, proce-
dures, and policies for historic preservation: its role in the community planning and
development process. Spring. Howard.

258 SEMINAR IN COMMUNITY CAPITALISM (PLCY 258) (3). Limited to
graduate students. Community capitalism reflects the convergence of business and
community development interests. The seminar explores theory and applications in
inner city business and capital markets, development finance, and urban policies.
Requires a major research project. Fall. Stegman.

261 ECONOMIC DEVELOPMENT POLICY (3). Introduction to basic theories,
concepts, and strategies employed to pursue local and regional economic develop-
ment. Clarifies similarities and distinctions with related planning perspectives
including community development, investigates the economic logic behind various
development initiatives, and reviews basic principles for critically examining alterna-
tive policies and programs. Spring. Feser.

263 DEVELOPMENT PLANNING TECHNIQUES (3). Intermediate and
advanced techniques for analyzing the development of local and regional economies.
Social accounts, indicator construction, regional input-output models, economic
and fiscal impact analysis, labor market analysis, and regional economic forecasting
techniques. Spring. Goldstein.

264 URBAN AND REGIONAL DEVELOPMENT SEMINAR (3). Fundamental
courses and theories applied to local economic development including growth,
trade, product-cycle, flexible specialization, and entrepreneurship theories. Urban
and regional development issues addressed in the North American, South American,
European, or South Asian contexts. Fall. Tewari, Malizia.

266 COMMUNITY DEVELOPMENT PLANNING (3). Social, political, and eco-
nomic theory of local communities. Models of neighborhood change. Neighborhood
revitalization: theoretical aspects, federal, state, and local programs: role of nonpro-

267 DEVELOPMENT FINANCE (3). Community development financial institu-
tions and loan funds for local asset building and wealth creation. Investment analy-
sis to structure and finance local projects. Real estate and business development
cases. Fall. Malizia.

268 TECHNIQUES IN NEIGHBORHOOD REVITALIZATION (3). The steps
involved in developing neighborhood revitalization plans. Students work with local
neighborhood associations in identifying both community assets and problems and
the various stakeholders, conducting research on selected issues, developing and
selecting strategies for addressing those issues, and formulating an implementation
strategy. Fall. Rebe.
270 INTERNATIONAL DEVELOPMENT AND SOCIAL CHANGE (3). Prerequisite, must be a graduate student. Course explores: a) impact of the global economy on national and community development; b) effect of environmental degradation processes on development, and c) explores strategies to guide social, economic and environmental change. Fall. Lacey.

288 ADVANCED ECONOMIC ANALYSIS FOR PUBLIC POLICY I (PLCY 288) (3). Economic theory applied to policy issues. Policy issues analyzed require microeconomic theory, including theory of utility and demand, organization and operation of product and factor markets, production theory, regulation, and welfare economics. Fall. Staff.

289 ADVANCED ECONOMIC ANALYSIS FOR PUBLIC POLICY II (PLCY 289) (3). Prerequisite, PLAN 288. Additional public policy issues addressed to study further applications of economic theory issues require principles of taxation, fiscal and monetary theory, and regulation and growth theory. Spring. Luger.

301 DESIGN OF POLICY-ORIENTED RESEARCH (PLCY 301) (3). Logic of designing research for the analysis of planning problems and the formulation of public policies. Elements of research design, case study, survey research, quasi-experimental designs, and the social experiment are covered. Spring. Goldstein.

302 ADVANCED SEMINAR IN RESEARCH DESIGN (PLCY 302) (3). Prerequisite, PLAN 301. Advanced treatment of topics introduced in PLAN 301. Spring. Faculty.

310, 311 PLANNING SEMINAR (Var.). Original research, fieldwork, readings, or discussion of selected planning issues under guidance of a member of the faculty. Fall or spring. Faculty.

315 INDEPENDENT STUDY (Var.). This course permits full-time graduate students enrolled in the Department of City and Regional Planning who wish to pursue independent research or an independent project to do so under the direction of a member of the department faculty. Fall or spring. Faculty.

353 PH.D. SEMINAR IN ENVIRONMENTAL MANAGEMENT AND POLICY (ENVR 353, PLCY 353) (1). Prerequisites, doctoral standing and permission of the instructor. Ph.D. seminar on theory, methods, and current research and literature in environmental management and policy. One to two seminar hours per week. Fall, spring, summer. Andrews.

355 APPLIED RESEARCH SEMINAR IN ECONOMIC DEVELOPMENT/SCIENCE AND TECHNOLOGY POLICY (3). Explores current issues in economic development and science and technology policy through a series of scholarly presentations and student research projects. Spring. Luger.

392 MASTER'S PROJECT (1-3). The master's project is original work, involving a substantial degree of independent research and/or analysis. May be a research paper, critical essay, development and evaluation of a program, project, or plan. Faculty.

394 DOCTORAL DISSERTATION (Var.). Faculty.

DEPARTMENT OF CLASSICS
WILLIAM H. RACE, Chair

Professors
George W. Houston (4) Latin Literature, Roman History, Epigraphy
Jory Linderski (27) Cicero, Roman Law, Roman History
Sara Mack (24) Virgil, Augustan Poetry, Homer
James J. O'Hara (2) Latin Poetry, Latin and Greek Literature
William H. Race (42) Pindar, Greek Poetry, the Classical Tradition
Kenneth J. Reckford (11) Greek and Roman Comedy, Roman Satire
G. Kenneth Sams (13) Greek Archaeology, Anatolian And Near Eastern Archaeology
Philip A. Sadove (16) Greek Historiography, Plato, Renaissance Latin
William C. West III (17) Classical Greek Prose, Greek History, Latin Literature
Cecil W. Wooten (35) Greek and Latin Prose, Rhetoric, Greek and Latin Language

Associate Professors
Carolyn L. Conner (39) Byzantine Studies
Donald Haggis (40) Greek Archaeology, Aegean Prehistory, Bronze Age and Early Iron Age Greece
Peter M. Smith (26) Greek Philosophical Literature, Greek Tragedy, Homer

Assistant Professors
Sharon L. James, Latin Poetry, Women in Antiquity
Maura Lafferty, Medieval and Classical Latin, Palaeography
Nicola Terrenato (6) Roman Archaeology and Art

Adjunct Professors
W. James McCoy (17) Greek History
Mary C. Sturgeon (31) Greek Art
Richard J. A. Talbert (18) Roman History

Professors Emeriti
Edwin L. Brown
Henry R. Immelwirth
Gerhard Keoppel

Graduate work in the Department of Classics is primarily designed to meet the needs of students who intend by intensive study and research to specialize in the Classics. The M.A. prepares especially for teaching at the secondary level; the Ph.D. for research and teaching at the university level.

The department cooperates with the other language departments in the University in making available the great literatures of the world. To this end the department offers courses in Greek and Latin literature which do not require an ability to read either language in the original. Such courses are designed to emphasize aspects of the Greek and Latin genius, the forms of literature created in the ancient world and perpetuated, and the permanent contributions of Greece and Rome to Western civilization. These courses may be elected as part of a major for the Curriculum in Comparative Literature or as a minor or part of a major in other departments.

The department also offers courses in classical and medieval Latin for students of medieval studies in other departments.

The University is a contributing member of the American Academy in Rome, the American School of Classical Studies at Athens, the Archaeological Institute of America, the American Research Institute in Turkey, and the Institute of Nautical Archaeology. There are thus numerous opportunities for study and archaeological activity abroad.

Requirements for Advanced Degrees
The degree of Master of Arts is offered with a concentration in Greek, Latin, or Classical Archaeology. The degree of Doctor of Philosophy is offered with a concentration in Greek and Latin, Classics with historical emphasis, Classical Archaeology, or Classical Latin and Medieval Studies. A minor in related departments may be permitted on application. Students may broaden their program by taking supporting work in related languages or literatures or in Art, History, Linguistics, or Philosophy.

Teaching assistant or lecture instruction equivalent to at least three contact hours a week for one semester, or until teaching competence is acquired, is required of all doctoral candidates. In practice, almost all students acquire several years of supervised teaching experience.

Requirements for advanced degrees are stated in general in the section "Graduate Degree Requirements," but exact prescription of the courses can be determined only upon consultation with the needs of the individual applicant. A brochure describing the various programs in greater detail is available from the department, and is also online as part of the Graduate School's web page.
Graduate students in other departments may, with the approval of their department adviser, pursue a minor in Medieval Studies through the Department of Classics; for details see the last section of the Classics entry.

Greek

Courses for Graduates and Advanced Undergraduates

106 GREEK DIALECTS (3). Prerequisite, Greek 22. Staff.
107 GREEK COMPOSITION (3). Prerequisite, Greek 21 or 22. Smith.
108 READINGS IN EARLY GREEK POETRY (3). Prerequisite, Greek 21 or 22. (Alternate years.) Staff.
109 READINGS IN GREEK LITERATURE OF THE FIFTH CENTURY (3). Prerequisite, Greek 21 or 22. (Alternate years.) Stadler, West.
110 READINGS IN GREEK LITERATURE OF THE FOURTH CENTURY (3). Prerequisite, Greek 21 or 22. (Alternate years.) West, Wooten.
140, 141 PROBLEMS IN THE HISTORY OF CLASSICAL IDEAS (3). Prerequisite, permission of the department.
158 GREEK NEW TESTAMENT (RELI 119) (3). Prerequisite, Greek 21. Offered on application by five students. Stadler.

Courses for Graduates

NOTE: One or two Greek courses numbered in the 200s are offered each semester.

201 GREEK EPIGRAPHY (3). West.
211 GREEK LYRIC POETRY (3). Race.
212 GREEK TRAGEDY (3). Smith, Reckford, Race.
213 GREEK COMEDY (3). Reckford.
214 GREEK PHILOSOPHICAL LITERATURE (3). Smith.
215 GREEK RHETORIC AND ORATORY (3). Wooten.
216 GREEK HISTORICAL LITERATURE (3). Stadler, West.
217 HELLENISTIC POETRY (3). Staff.
218 LATER GREEK PROSE (3). Stadler.
251 HOMER (3). Smith, Race.
252 SOPHOCLES (3). Reckford, Race.
253 THUCYDIDES (3). Stadler.
256 DEMOSTHENES (3). Wooten.
301 GREEK SEMINARS (3). Topics vary from year to year. Staff.
341 SPECIAL READING (3). Fall and spring. Staff.
393 MASTER’S THESIS (3 or more). Fall and spring. Staff.
394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

Latin

Courses for Graduates and Advanced Undergraduates

101X/102X ELEMENTARY LATIN FOR GRADUATE STUDENTS. These courses are designed as a preparation for the reading knowledge examination for higher degrees. Passing the examination at the end of 102 (102X) certifies that the requirement has been satisfied. Students whose major departments permit them to take these courses for credit should register for 101, 102. Those not expecting credit should register for 101X, 102X. One semester each. Staff.

110 INTRODUCTORY LATIN COMPOSITION (3). Prerequisite, Latin 22 or equivalent. Review of Latin grammar and idiom, exercises in composition, introduction to stylistics. (Alternate years.) Wooten.
111 READINGS IN LATIN LITERATURE OF THE REPUBLIC (3). Prerequisite, Latin 21 or 22. (Alternate years.) Linderski.
112 READINGS IN LATIN LITERATURE OF THE AUGUSTAN AGE (3). Prerequisite, Latin 21 or 22. (Alternate years.) Reckford, Mack, James.
113 READINGS IN LATIN LITERATURE OF THE EMPIRE (3). Prerequisite, Latin 21 or 22. (Alternate years.) Wooten.
114 READINGS IN LATIN LITERATURE OF LATER ANTQUITY (3). Prerequisite, Latin 21 or 22. Lafferty.
130 MEDIEVAL LATIN LITERATURE TO THE END OF THE CAROLINGIAN PERIOD (3). Prerequisite, Latin 14 or 102X. Lafferty.
140, 141 PROBLEMS IN THE HISTORY OF CLASSICAL IDEAS (3). Prerequisite, permission of the department.

Courses for Graduates

NOTE: One or two Latin courses numbered in the 200s are offered each semester.

202 LATIN EPIGRAPHY (3). Houston, Linderski.
203 LATIN PALEOGRAPHY (3). Lafferty.
207 LATIN COMPOSITION AND PROSE STYLES (3). Wooten.
210 HISTORY OF LATIN AND ITALIC DIALECTS (3).
221 FRAGMENTS OF EARLY LATIN POETRY (3). Mack.
222 ROMAN HISTORICAL LITERATURE (3). Study of Sallust, Caesar, Suetonius, or the minor historians of the empire. Linderski.
224 ROMAN DRAMATIC LITERATURE (3). Study of the comedies of Plautus and Terence or the tragedies of Seneca. Reckford.
225 ROMAN LYRIC AND ELEGIAIC POETRY (3). Study of the forms of lyric and elegiac poetry with special attention to Catullus, Horace, Tibullus, or Propertius. Reckford, Mack, James.
226 ROMAN SATIRE (3). Study of the development of satiric forms with special attention to Horace or Juvenal. Reckford.
227 OVID AND LITERARY THEORY (3). Introduction to literary theory through a study of Ovid and scholarly approaches to his poetry. James.
230 LATIN LITERATURE FROM THE TENTH TO THE THIRTEENTH CENTURIES (3). Reading in selected medieval Latin prose and verse authors. Lafferty.
261 CICERO: POLITICAL CAREER (3). Linderski.
262 CICERO: LITERARY CAREER (3).
263 LUCRETIUS (3). Reckford, O’Hara.
264 VIRGIL (3). Mack, O’Hara.
265 LIVY (3). Linderski.
266 OVID (3). Mack O’Hara, James.
270 PETRONIUS (3). Wooten.
274 TACITUS (3). Houston.
301 LATIN SEMINARS (3 each). Topics vary from year to year. Staff.
341 SPECIAL READING (3). Fall and spring. Staff.
393 MASTER’S THESIS (3 or more). Fall and spring. Staff.
394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.


**Classical Archaeology**

Courses for Graduates and Advanced Undergraduates

140, 141 PROBLEMS IN HISTORY OF CLASSICAL IDEAS (3). Prerequisite, permission of the department.

148 ART IN THE AGE OF JUSTINIAN AND THEODORA (ART 148) (3). An interdisciplinary course based on monuments, history, and contemporary writings of the Byzantine empire during the rule of Justinian and Theodora. The approach is comparative, analytical, and contextual and includes a feminist perspective. Fall. Connor.

149A CONSTANTINOPLE: THE CITY AND ITS ART (ART 149A) (3). Interdisciplinary study of the city of Constantinople during the Byzantine empire, with emphasis on the artistic, social, and cultural context. Includes study of monuments and their decoration, objects, contemporary documents, and sources, all within a chronological, historical framework. Fall or spring. Connor.

149B IN CONSTANTINOPLE (ART 149B) (3). Taught primarily in Istanbul, once Constantinople, the course provides first-hand experience with monuments and an overview of the history, topography, and culture of the city. Summer. Connor.

182 MOSAICS: THE ART OF MOSAIC IN GREECE, ROME, AND BYZANTINIUM (ART 182) (3). Prerequisite, any course in classics, art history, or religious studies. Traces the development of mosaic technique from Greek antiquity through the Byzantine Middle Ages as revealed by archaeological investigations and closely analyzes how dynamic medium conveyed meaning. Spring. Connor.


189 THE ARCHAEOLOGY OF ANATOLIA IN THE BRONZE AND IRON AGES (3). A survey of Anatolian archaeology from the third millennium through the sixth century B.C. (Alternate years.) Sams.

190 GREEK ARCHITECTURE (3). (Alternate years.) Sams.

191 ARCHITECTURE OF ETRURIA AND ROME (3). (Alternate years.) Terrenato.

192 ROME AND THE WESTERN PROVINCES (3). Survey of the material remains of the western provinces of the Roman Empire, with attention to their historical context and significance. Fall. Terrenato.


194 ARCHAIC GREEK SCULPTURE (ART 194) (3). (Alternate years.) Surgeon.

195 CLASSICAL GREEK SCULPTURE (ART 195) (3). (Alternate years.) Surgeon.

196 HELLENISTIC GREEK SCULPTURE (ART 196) (3). (Alternate years.) Surgeon.

198 AEGEAN CIVILIZATION AND NEAR EASTERN BACKGROUNDS (ART 198) (3). (Alternate years.) Haggis.

199 THE ARCHAEOLOGY OF DARK AGE GREECE (3). Prerequisites, CLAR 41, 49, 94, or 158; or by permission. Issues and problems in the analysis of the Greek Dark Age and its material culture from the collapse of the Bronze Age palaces to the earliest Greek city states. Fall. Haggis.

Courses for Graduates

201 GREEK EPGRAPHY (3). See courses in Greek.

202 LATIN EPGRAPHY (3). See courses in Latin.

290 FIELD PRACTICUM IN ARCHAEOLOGY (3). Seminar in archaeological excavation techniques to be conducted in the field. Previous excavation experience is expected. Summer or fall. Haggis, Sams, Terrenato.

294 GREEK TOPOGRAPHY (ART 294) (3). Study of chief archaeological sites of Greece and of existing buildings and monuments. Attention to the problems of excavation and the role of the sites in Greek history. (Alternate years.) Sams.

296 ROMAN SCULPTURE (ART 296) (3). (Alternate years.) Staff.

297 ROMAN PAINTING (ART 297) (3). (Alternate years.) Staff.

298 ROMAN TOPOGRAPHY (ART 298) (3). (Alternate years.) Terrenato.

299 ETRUSCAN ART (ART 299) (3). (Alternate years.) Staff.

310 SEMINAR IN ARCHAEOLOGY (ART 310) (3). Topics vary from year to year. Staff.

341 SPECIAL READING IN ARCHAEOLOGY (3). Fall and spring. Staff.

358 SEMINAR IN ANCIENT ART (ART 358) (3). Fall and spring. Surgeon.

393 MASTER'S THESIS (3 or more). Both semesters. Staff.

394 DOCTORAL DISSERTATION (3 or more). Both semesters. Staff.

**Classics in English**

Courses Not Requiring a Reading Knowledge of Greek and Latin

The following courses in classical literature and civilization are especially designed to supply the necessary foundation for those who, without a reading knowledge of the ancient languages, wish for a broader culture or plan to specialize in modern literature, history, art, etc. When approved these courses may count as part of the major requirements in other departments. The courses may also be taken to satisfy the requirements of a minor in literature. See also Comparative Literature.

Courses for Graduates and Advanced Undergraduates

109 GREEK AND ROMAN HISTORICAL LITERATURE (3). The study in English translation of selections from Herodotus, Thucydides, Livy, Tacitus, and others with consideration of the literary qualities of the selections and the readability of the authors as historians. (Alternate years.) Lindeski.

115 ROMAN LAW (3). The course presents an introduction to Roman law, public and private. On the basis of Roman texts in translation (or the original if desired), the class will discuss a) the principles of Roman constitutional law and b) the legal logic and social importance of Roman civil law. (Alternate years.) Lindeski.

118 INTRODUCTION TO BYZANTINE CIVILIZATION (3). Intellectual and social history of the Byzantine Empire from Justinian to 1453; noting the interaction of classical and Christian culture and Byzantium’s influence on neighboring peoples and on the Renaissance. (Alternate years.) Connor.

235 CLASSICAL CRITICISM (CMPL 235) (3). (Alternate years.) Wooten.

**Medieval Studies**

Minor in Medieval Studies

Graduate majors in other departments who wish to declare a Medieval Studies minor may do so with the approval of their departmental adviser. Any student may, of course, take Medieval Studies courses without seeking a formal minor.

The graduate minor in Medieval Studies will consist of:

- Two courses in Latin: i.e., Latin 203 (Paleography) or its equivalent in another language (including Hebrew, Greek, and Arabic or another language pertinent to the student's course of study) and an advanced course in Latin or the chosen language. Students may be able to substitute for one language course a course requiring extensive paleographic training. This substitution will require approval of the graduate adviser in Medieval Studies and the student's departmental adviser.
Three courses from at least two of the departments, curricula, or programs listed below. A student may not count courses taken in the major department toward this minor (with the exception of the Introduction to Medieval Studies, currently proposed as History 201).

Art: 111, 112, 154, 350, 351
Classics: Latin 102, 115, 130, 203, 230, 304, Classics 118, Classical Archaeology 148, 149A, 310
Comparative Literature: 170, 241
History: 106, 107, 109, 110, 133, 134, 201, 223, 224, 239, 243, 245, 311, 312
Music: 240, 251
Philosophy: 152
Religious Studies: 137, 169, 269, 308
Romance Languages: Arabic 201/202, French 126, 221, 222, 233, 248, 331, Italian 111, 221, 231, 232, 245, Romance 220, 225, 324, Spanish 213, 221, 222, 224
Slavic: 100

Appropriate courses and seminars may be substituted for the above courses with the permission of the instructor and the Medieval Studies adviser.

Courses in Medieval Studies

Art
111 Topics in Early Medieval Art. Verkerk, Folda.
112 Topics in High Medieval Art. Folda, Verkerk.
154 Northern Art of the Fourteenth and Fifteenth Centuries. Folda.
350 Seminar in Medieval Art. Folda.
351 Seminar in Medieval Art. Verkerk.

Classics
Latin 102 Section ML: Elementary Medieval Latin for Graduate Students. Staff.
Latin 115 Latin Literature of the Later Empire/Augustine.
Latin 130 Medieval Latin to the End of the Carolingian Age.
Latin 203 Latin Paleography.
Latin 230 Latin Literature from the Tenth to the Thirteenth Centuries.
Latin 304 Medieval Seminar.
Classics 118 Introduction to Byzantine Civilization. Connor.
Classical Archeology 149A Constantinople: City and Art. Connor.

Comparative Literature
170 The Middle Ages. Kennedy.
241 History of Literary Criticism, Plato to 1750. Masters.

English
105A/105B Celtic (Old Irish or Old and Middle Welsh). O'Neill.
106A/106B Readings in Old Irish or Old Welsh. O'Neill.
151 English Literature of the Middle Ages. Leinbaugh.
153 Medieval Romance. Kennedy.

238 History of the English Language. Eble, O'Neill.
250 Beowulf. Leinbaugh, O'Neill, Witte.
251 Studies in Middle English Literature. Kennedy, Witte.
350 Seminar in Old English Language and Literature. Witte, O'Neill, Leinbaugh.
351 Seminar in Middle English Literature. Kennedy, Witte.

Germanic Languages
160 History of the German Language. Roberge.
210 Topics in Medieval Literature.
233 Old Norse I.
234 Old Norse II.
255 Gothic. Roberge.
260 Old Norse I (Old Icelandic).
261 Old Norse II (Old Icelandic).
270 Old High German. Roberge.
271 Middle High German. Francke.
275 Old Saxon. Roberge.

History
106 The Medieval Church. Pfaff.
107 Europe in the Early Middle Ages.
109 Medieval Thought and Learning.
110 The Medieval University. McVaugh.
133 English Economy and Society, 1200-1700. Bennett.
201 Introduction to Medieval Studies. Staff.
223 Readings in Medieval Women's History. Bennett.
224 France, the German Empire, and the Papacy in the High Middle Ages.
243 Late Medieval England. Bennett.
311 Medieval History.

Music (Monophonic Song)

Philosophy
152 Topics in Medieval Philosophy. Galligan, Long.

Religion
137 The Art of Devotion in Medieval and Early Modern Europe.
308 Methods and Topics in the Study of Western Religious Traditions. Staff.
Romance Languages
Arabic 201/2 Romance Arabic Studies.
French 221 Old French. Montgomery.
French 222 Old French Literature. Montgomery, Amer.
French 233 The French Medieval Drama. Montgomery, Amer.
French 248 French Literature of the Fourteenth and Fifteenth Centuries. Montgomery.
French 331 Seminar in Old French Literature. Montgomery.
Italian 111 Survey of Italian Literature I. Rao.
Italian 221 Old Italian. Montgomery.
Italian 231/2 Dante. Cervigni, Illiano.
Italian 245 The Italian Trecento. Cervigni.
Romance 220 Vulgar Latin. Montgomery.
Romance 225 Provencal. Montgomery.
Romance 324 Romance Paleography. Montgomery.
Spanish 213 Medieval Poetry. Dominguez, Banderas.
Spanish 221/2 Old Spanish. Binotti.
Slavic
100 Old Church Slavonic. Feinberg, Greenberg, Janda.

DEPARTMENT OF COMMUNICATION STUDIES
V. WILLIAM BALTHROP, Chair

Professors
Robert C. Allen (21) Film and Media History, Media Criticism, Cultural History,
and the History of Popular Culture
V. William Balthrop (1) Rhetorical Theory and Criticism, Cultural Studies,
Argumentation
J. Robert Cox (3) Rhetorical Theory and Criticism, Environmental Advocacy
Lawrence Grossberg (19) Cultural Studies, Popular Culture, Popular Music,
Philosophy of Communication and Culture
Gerald C. Horne (23) Film and Theater History
Gorham A. Kindem (10) Documentary Production, Film History, Media Aesthetics
Beverly Whitaker Long (7) Performance of Literature, Performance Criticism,
Recent American Poetry
Della Pollock (9) Performance of Literature, Performance Theory and Criticism,
Cultural Studies
Lawrence B. Rosenfeld (11) Interpersonal Communication, Family
Communication, Empirical Research Methodology
Julia T. Wood (12) Interpersonal Communication, Gender and Communication,
Feminist Theory

Associate Professors
Cori Dauber (2) Rhetoric and Public Address
Paul Ferguson (5) Performance of Literature, Directing, Adaptation and Script Writing
Joanne Hensfield (20) Film Theory and Criticism, Third World Film, Film and Video Production
D. Soyini Madison (15) Theory and Ethnography of Performance, African American and Third World Women's Texts
Steven K. May (13) Organizational Communication, Cultural Studies
Michael S. Waltman (14) Interpersonal Communication, Social Cognition

Assistant Professors
Richard C. Canie, Media and Cultural Studies
Erik Dorrud, Rhetoric, Critical Theory
Ken Hillis, Communication Technology
Victoria Johnson, Media and Cultural Studies
Patricia S. Parker, Organizational Communication and Culture; Critical Studies in Gender; Race; Organizational Leadership

Professors Emeriti
Elizabeth Czech-Beckerman
Robert J. Gwyn
Martha Nell Hardy
William M. Hardy
James W. Pence Jr.
Wesley H. Wallace

The Department of Communication Studies offers graduate work leading to the degrees of Master of Arts and Doctor of Philosophy. A variety of courses are offered, including interpersonal and organizational communication, media studies, performance studies, rhetoric and critical theory, and communication and cultural studies.

The program is designed to develop scholars, teachers, and practitioners capable of producing, disseminating, and applying knowledge in the academic community and in the broader public sphere. Graduates have continued their study in higher degree programs, accepted teaching positions at various levels, and accepted positions in training and development, administration, the arts, and media production in both public and private organizations.

Master of Arts Degree
Students are free to develop their own program of study with faculty guidance and approval. Focus and depth are expected. Students must meet the following requirements:
1. Thirty semester hours of graduate-level course work, including either three or six hours of thesis credit. Fifteen of these thirty hours should be in courses numbered 200 and over.
2. Passing COMM 360, a course to prepare students to teach.
3. Passing COMM 200, an introductory course in intellectual history in communications and related fields; COMM 201, Research Colloquium.
4. Passing at least one course designed to develop capability in critical, historical, and/or social scientific methods of communication research.
5. Passing an oral comprehensive examination, usually in the third semester of study.
6. Completing a research or production-centered thesis, including an oral defense, for three or six hours credit, depending upon the breadth of the enterprise.
7. Completing all requirements and deadlines of the Graduate School for the M.A. degree.

Doctor of Philosophy Degree
Degree Requirements
The doctoral program in Communication Studies emphasizes the development of programs of study appropriate to each student's particular interests and to normative expectations for sophisticated, focused dissertation research (cf. Normative Practices for Doctoral Studies, Graduate School, UNC-Chapel Hill, November 18, 1992). Each student is required to take courses appropriate for her or his program of study from four groups. The first group, core courses, assures that each student is exposed to the variety of communication theories prominent in the discipline, and current communication research practices. The second group, courses in the primary
concentration, includes a research methods course in the area of primary
collection, a core seminar, advanced seminars that require students to
produce original research in the area of concentration, and a research
practicum that serves as the springboard for dissertation work. The third
group, courses in a secondary concentration, includes a minimum of three
courses in an area of the department not selected as the area of specializa-
tion. Areas appropriate to the specialization and secondary concentration
include interpersonal and organizational communication, media studies,
communication and cultural studies, performance studies, and rhetoric and
critical theory. Finally, the fourth area, cognate courses, includes at least two
courses outside of Communication Studies related to the work done in the
specialization and/or the secondary concentration.
Completion of the Ph.D. program - including coursework, a qualifying
examination, and a dissertation - normally requires four years of study
beyond the M.A. degree.

Admissions Requirements
Application for admission to the Department of Communication Studies
must be made on the application form provided by the Graduate School.
Applicants are admitted for the fall semester only.
All applications must be completed by January 1, and should include the
following:
1. The General Record Examination, with a recommended minimum score
above the fiftieth percentile on both the verbal and quantitative sections;
2. Two official transcripts from at least two of post-secondary educational institutions;
3. Three letters of recommendation, at least two of which should include specific details about the applicant's educational background; and
4. A personal statement explaining why the applicant wishes to pursue
graduate work in this department, his/her goals, and any additional in-
formation not requested elsewhere.

In addition to the requirements for admission to the graduate program,
applicants for the Doctor of Philosophy degree program must have a mas-
ter's degree in Communication Studies or a related discipline from an
accredited college or university in the United States or its equivalent from a
foreign institution and must submit a sample of scholarly writing that
shows promise of the ability to conduct research and/or write effectively
for a scholarly or professional audience.
International applicants must also include a financial certificate and
TOEFL scores.
For more information, please contact the Director of Graduate Studies,
Department of Communication Studies, CB# 3285, Bingham Hall, Chapel
Hill, NC 27599-3285, or visit the department's website at www.unc.edu/
depths/comm.

Financial Aid
Financial assistance is available in several forms. Please see the financial aid
chapter in this catalog for more information on various sources of available
funds and deadlines.
All applicants to the department are eligible for teaching and/or research
assistantships; applicants should indicate their desire for such an award on
the application form. Generally, first-year students assist with two introd-
tory undergraduate courses. Applicants for the Doctor of Philosophy degree
may have responsibility for their own class depending upon previous expe-
rience. All assistantship assignments are awarded on a competitive basis. In
some cases, out-of-state applicants who are awarded an assistantship are re-
commended by the department for a remission of the out-of-state portion of
their tuition.

To be considered for the Graduate School's Competitive Merit
Assistantship, applications must be completed by January 1.

Courses for Graduates and Advanced Undergraduates
NOTE: Courses are offered on demand except as otherwise noted.

110 INTRODUCTION TO QUANTITATIVE RESEARCH (3). Basics of data
collection, measurement, instrument development, and data analytic approaches to
communication research are presented to the student. Emphasis on practical appli-
cation of research.

111 INTRODUCTION TO CRITICAL PERSPECTIVES (3). This course
explores theories of criticism and symbolic action through readings, lecture, and
practical criticism of literature, media, discourse, and other symbolic arts

112 PERSUASION (3). Examines contemporary theory and practice of influencing
others' attitudes, beliefs, and actions. Focuses particularly on analyzing and develop-
ing persuasive messages.

113 POLITICAL COMMUNICATION (3). A course covering the relationship
between communication and political processes and institutions. Topics include
media coverage and portrayal of political institutions, elections, acros, and media
influence on political beliefs.

120 INTERPERSONAL COMMUNICATION (3). Course focuses on how com-
munication is used to build and sustain interpersonal relationships. Forms and func-
tions of communication are examined as a means of testing and defining relationships.

121 COMMUNICATION AND SOCIAL COGNITION (3). An investigation of
psychological aspects of communication, particularly the perceptual and interpretive
processes underlying the sending and receiving of messages.

122 TRANSCULTURAL COMMUNICATION (3). Prerequisite, one of the fol-
lowing: COMM 22, 72, 73, 74. Examines interpersonal and public communication
among people from different cultures. Includes case studies of individuals, subcul-
tures, and nations.

123 COMMUNICATION IN ORGANIZATIONS (3). Provides a critical explo-
ration of organizational communication theory, research, and application, examining
factors involved in the functioning and analysis of complex organizations.

124 FAMILY COMMUNICATION (3). Analysis and exploration of personal
experiences, family systems theory, and communication theory to describe, evaluate,
and improve family communication patterns.

125 COMMUNICATION AND LEADERSHIP (3). Critical examination of
alternative theories of leadership and trends in the study of leadership; focuses on
the communicative dimensions of leaderships.

126 NONVERBAL COMMUNICATION (3). Examines the roles and functions of
nonverbal behavior in the communication process. Topic areas may include physi-
cal appearance; body, face, and eye movement; paralinguistics: kinesics; nonverbal
deception; the effects of environment; and personal space.

127 INTRODUCTION TO PHONETICS (SPHS 130) (3). Detailed study of the
international phonetic alphabet with emphasis on the sound system of American
English. Application of phonetics to problems of pronunciation and articulation.

129 TOPICS IN INTERPERSONAL AND ORGANIZATIONAL COMMUNICA-
TION (3). Designed for advanced students, course provides in-depth examina-
tion of particular theories of human communication. Course focus varies. May be
repeated.

130 ADVANCED AUDIO PRODUCTION (3). Prerequisite, COMM 34, 41, or
permission of instructor. Advanced analysis and application of the principles and
methods of audio production.

131 TELEVISION DIRECTING (3). Prerequisite, COMM 32. The aesthetics of
television directing: script analysis, design of performance, set and lighting design,
creative visual and audio communications. Students direct several television projects.
132 ADVANCED SCRIPTWRITING FOR TELEVISION, FILM, AND STAGE (3). Prerequisite, COMM 33 or permission of instructor. Each student completes a major writing project, either dramatic or nonfiction, for radio, television, film, or stage.

133 MEDIA ACTING AND PERFORMANCE (3). Study and practice in acting and performance for radio, television, and motion pictures.

134 NARRATIVE PRODUCTION (3). Prerequisites, COMM 34, 41, or previous production experience. The course focuses on narrative, representational, and aesthetic strategies of narrative production.

135 DOCUMENTARY PRODUCTION (3). Prerequisites, COMM 34, 41, or previous experience. This course is a workshop in the production of video/film non-fiction or documentary projects. The course focuses on narrative, representational, and aesthetic strategies of documentary production.

136 INTERACTIVE MEDIA (ART 135) (3). Prerequisites, COMM 34, 41, or permission of instructor. Explores interactive media through creative projects that include sound, video, and graphic elements. Technical information will serve the broader goal of understanding the aesthetics and critical issues of interactive media.

139 SPECIAL TOPICS IN MEDIA PRODUCTION (3). A special topics course on a selected aspect of media production or writing. May be repeated.

140 MASS MEDIA CRITICISM AND THEORY (3). Examination and application of contemporary critical approaches to mass-mediated works; survey of current issues in aesthetic theory as related to mass media.

141 AUDIO THEORY, CRITICISM, AND AESTHETICS (3). An examination of theories of audition, psychoacoustics, and the development of the audio aesthetics. Course includes, but is not limited to, audio in film, video, and multimedia installations.

42 THE DOCUMENTARY IDEA (3). Historical and theoretical examination of expressions of the documentary idea in different eras and various modes, including film, television, and radio.

143 HISTORY OF NATIONAL MEDIA IN THE WEST (3). Study of the development of the art and craft of the film through examining individual films and topics stressing the interaction of aesthetic considerations with sociocultural and institutional settings.

144 COMMUNICATION AND INFORMATION TECHNOLOGIES (3). A survey of developing telecommunication systems and technologies and their impact on the traditional electronic media and society.

145 INFORMATIONAL BROADCASTING (3). Study of the structure, preparation, and production of informational radio and television programs including the investigative documentary and radio and television "talk" programs. Instruction in data collection, analysis, and preparation of informational programs.

146 HISTORY OF FILM I - 1895 TO 1945 (3). Prerequisite, COMM 41. Study of the development of the art of film through World War II by examining individual films and filmmakers and the emergence of national cinemas through interaction among aesthetic, social, economic, and technological factors.


148 CINEMA OF THE THIRD WORLD (3). Designed for the nonmajor, this course examines contemporary filmmaking in Africa, Latin America, and the Middle East. Emphasis on the non-Western film and its aesthetic response to the conventions of "dominant" Hollywood style. (B.A. Non-Western/Comparative perspective.)

149 THIRD WORLD MEDIA (3). A study of the cultural and educational uses of radio and television in the developing countries of Africa, Latin America, and India. Emphasis on the electronic media and their effectiveness in serving developing countries.

150 MEDIA AND POPULAR CULTURE (3). An examination of the communication processes and cultural significance of popular film and television, and other electronic media.

151 CONTEMPORARY INTERNATIONAL FILM/TELEVISION (3). Study of contemporary film/television within a specific international context, such as Scandinavia or Great Britain, with particular attention to comparisons and contrasts with the United States and Hollywood.

152 MINORITIES AND THE MEDIA (3). The course traces the development of minorities in film, radio and television, and the press, looking at trends and treatment of minorities by the media and how and if they have changed.

153 COMMUNITY AND MEDIA (3). A study of the electronic media as a feedback mechanism for community organization and social change. A variety of broadcast and nonbroadcast uses of the media are studied.

154 MEDIA LAW AND REGULATION (3). A study of laws affecting media; the role of the courts and federal regulatory agencies in media regulation.

155 INTERNATIONAL COMMUNICATION AND COMPARATIVE JOURNALISM (JOMC 146, POLI 146) (3). Development of international communication; the flow of news and international propaganda; the role of communication in international relations; communication in the developing nations; comparison of press systems.

156 WOMEN AND FILM (WMST 143) (3). This course examines the representations of women in contemporary American film. We also consider women as producers of film.

157 IMPLICATIONS OF ELECTRONICALLY MEDIATED COMMUNICATION (3). An examination of optical/digital technologies and the social practices and communicatory processes they encourage and subvert.

158 LATIN AMERICAN CINEMA AND CULTURE (3). This course examines the films, audiences, and social contexts of Latin American cinema from the 1930s to the present.

159 SPECIAL TOPICS IN MEDIA STUDIES (3). A special topics course on a selected aspect of mass media studies, including but not limited to media texts, contexts, and/or reception. May be repeated.

160 PERFORMANCE OF LITERATURE BY WOMEN OF COLOR (WMST 146) (3). Prerequisite, COMM 60 or permission of instructor. Explores through performance contemporary poetry, fiction, non-fiction, and feminist thought by women of color in the United States.

161 ORAL HISTORY AND PERFORMANCE (WMST 173, HIST 173, FOLK 161) (3). This course combines readings and fieldwork in oral history with study of performance as a means of interpreting and conveying oral history texts. Emphasis on women's history.

162 GROUP PERFORMANCE (4). Prerequisites, COMM 60, 61, one 100-level performance course and permission of the instructor. Theory and practice in adaptation, direction, and group performance of texts.

163 PERFORMANCE OF CHILDREN'S LITERATURE (3). Prerequisites, COMM 60 and permission of the instructor. Course explores of children's performance with a focus on including and excluding participation in children's performances. Both solo and group performances for young audiences are included.

164 POETRY IN PERFORMANCE (3). Prerequisite, COMM 60 or permission of instructor. Critical, aesthetic, and rhetorical approaches to performed poetry.

165 RITUAL, THEATRE, AND PERFORMANCE IN EVERYDAY LIFE (FOLK 165) (3). Prerequisite, COMM 60, ENGL 26, or permission of instructor. This course will explore the dynamics of performance as it is broadly produced within the texture of individual experiences, the interaction of community memberships, and the dramas of cultural aesthetics.
166 NARRATIVE FICTION IN PERFORMANCE (3). Prerequisite, COMM 60 or permission of instructor. Study of selected short stories and novels in performance with an emphasis on narrative point of view.

167 POLITICS OF PERFORMANCE (3). Prerequisites, COMM 60, 62 or permission of instructor. Course will address the relationship between performance and power, focusing on topics concerned with the potential for performance to contribute to social change.

168 NARRATIVE IN FICTION AND FILM: ADAPTATION AND PERFORMANCE (3). Study of narrative in selected short stories and novels and their adaptation for film.

169 SPECIAL TOPICS IN PERFORMANCE STUDIES (3). Prerequisite, COMM 60 and one 100-level performance course or permission of instructor. Advanced study of selected topics drawn from performance history, theory, and practice. May be repeated.

170 CLASSICAL RHETORIC (3). Lecture on the nature, development, and influence of Greek and Roman rhetoric, with class discussion of important rhetorical treatises.

171 RHETORICAL THEORY AND PRACTICE (3). Prerequisite, COMM 72, 74, or instructor's permission. Investigates contemporary theories of purposeful symbolic behavior; focus is on rational, psychological, and dramaturgic explanations of human behavior.

172 PUBLIC POLICY ARGUMENT (3). Analyzes arguments in a variety of contexts with an emphasis on public policy and exploring tensions involved in addressing both expert and public audiences in the political sphere.

173 THE AMERICAN EXPERIENCE IN RHETORIC (3). Prerequisite, COMM 72, 73, 74, or instructor's permission. Examines public discourse from the colonial period to the present. Discourses, critical perspectives, and historical periods studied will vary.

174 WAR AND CULTURE (PWAD 162) (3). This course examines American cultural myths about war and specifically about the causes of war, enemies, weapons, and warriors and the way these myths constrain foreign and defense policy, military strategy, and procurement.

175 ENVIRONMENTAL COMMUNICATION AND THE PUBLIC SPHERE (ENST 175) (3). Examines communication practices that accompany citizen participation in environmental decisions, including public education campaigns of nonprofit organizations, "risk communication," media representations, and mediation in environmental disputes. Spring. Cox.

176 SPEECHWRITING (3). Prerequisite, COMM 13 or 71. Introduces the student to the principles of writing speeches with special attention to adaptation to audience and occasion and to oral style.

179 SPECIAL TOPICS IN RHETORIC AND CULTURAL STUDIES (3). A special topics course on a selected aspect of Rhetoric and Cultural Studies. May be repeated.

180 INTRODUCTORY AUDIOLOGY (SPHS 123) (3). Theory and practice of the measurement of hearing, causative factors in hearing loss, evaluation of audio metric results, in demonstration of clinical procedures.

182 SPEECH SCIENCE (SPHS 140) (3). A study of the acoustic, articulatory, auditory, and physiological aspects of the production of speech.

183 ANATOMY AND PHYSIOLOGY OF THE SPEECH AND HEARING MECHANISM (SPHS 170) (3). Anatomy and physiology of the speech-producing and aural mechanism.

184 INTRODUCTION TO COMMUNICATION DISORDERS (EDUC 128) (3). Explores the etiology, epidemiology, assessment, and educational implications of speech and language disorders.

200 INTRODUCTION TO RESEARCH AND THEORY IN COMMUNICATION STUDIES (3). Prerequisite, admission to graduate program or permission of the chair. Considers theory and philosophy in the study of communication. Surveys major paradigms of contemporary social/cultural theory (and their roots in modern philosophy) in relation to examples of communication research and practice. First of two semesters.

201 RESEARCH COLLOQUIUM (3). Prerequisite, admission to graduate program or permission of the chair. Considers theory and philosophy in the study of communication. Surveys major paradigms of contemporary social/cultural theory (and their roots in modern philosophy) in relation to examples of communication research and practice. Second of two semesters.

210 RESEARCH IN INTERPERSONAL COMMUNICATION (3). Prerequisite, COMM 110. Special emphasis on survey research, content analysis, and experimental design. The design and analysis of communication data gathered in lab and field settings are reviewed. The course emphasizes multivariate data analytic techniques and their interpretation.

211 RHETORICAL CRITICISM (3). Prerequisite, COMM 170, 171, or instructor's permission. Investigates the function of rhetorical criticism, the critical method, and a variety of approaches to the performance of rhetorical criticism.

212 THE BODY AND PERFORMANCE (3). This course will explore through performance, the various ways the human body is "marked" or signified in culture. Fall, spring.

213 PERFORMANCE CRITICISM (3). Prerequisites, COMM 162, and 164 or 166. Deals with the key methods of describing and evaluating literature and literature in performance.

220 ORGANIZATIONAL COMMUNICATION ASSESSMENT (3). Prerequisite, COMM 123 or permission of the instructor. Examines various methods of communication research in organizations. Emphasis is on recurring problems and issues faced in research.

221 RESEARCH IN ORGANIZATIONAL COMMUNICATION (3). Explores theoretical, methodological, and practical issues encountered in ethnographic, case study, and field research on communication phenomena in organizations.

222 INTERPRETIVE STUDIES IN ORGANIZATIONAL COMMUNICATION (3). Prerequisite, COMM 123 or permission of instructor. Focuses on the theory and practice of interpretive organizational communication research, including organizational phenomena such as culture, metaphors, symbols, ritual, and narrative. Fall. May. Parker.

223 CRITICAL STUDIES IN ORGANIZATIONAL COMMUNICATION (3). Prerequisite, COMM 123 or permission of instructor. Focuses on the theory and practice of critical organizational communication research, including organizational phenomena such as power, discourse, and culture. Spring. May. Parker.

225 FEMINISM, SCIENCE, AND COMMUNICATION (3). Critical examination of key feminist arguments about science and communication scholarship as conventionally defined; exploration of alternative goals, assumptions, and practices for research consistent with feminist theories and methodologies.

226 COMMUNICATION IN CLOSE RELATIONSHIPS (3). Prerequisite, COMM 120. Examination of contemporary theory and research on communication in close relationships. Topics include communication in relational formation, change, and termination.

229 SEMINAR IN HUMAN RELATIONSHIPS (3). In-depth examination of contemporary research on communication and human relationships. Foci vary and may include intimacy, groups, families, and other communication relationships.

238 PRODUCTION STUDIES (3). Study the integration of audio/video/film theory and practice through lectures, readings, discussions, oral presentations, and the completion of audio, video, and film projects.
239 MEDIA PRODUCTION (3). Permission of the department. Study of problems involved in writing and producing various forms of media programming. Emphasis on script and production elements necessary to translate scripts into media products.

241 PERFORMANCE ETHNOGRAPHY (FOLK 241) (3). This seminar focuses on methods of ethnography and fieldwork ethics. Performance as theory and practice informs methodological inquiries as well as the analysis of specific ethnographic texts and case studies.

250 CULTURAL STUDIES (3). Prerequisite, graduate standing. Introduction for graduate students to the current literature and critical perspectives in the areas of Media and Cultural Studies.

251 RESEARCH METHODS IN MEDIA AND CULTURAL STUDIES (3). Prerequisite, graduate standing. Introduction to the issues, methods, and materials of research in media and cultural studies. Fall. Grossberg, Hersfield, Johnson.

252 STUDIES IN FILM AND TELEVISION (3). Selected studies of film and/or television history, theory, and/or criticism. Exact topic is announced before classes begin.

253 THEORIES OF THE AUDIENCE/PUBLIC (3). This course offers a sustained analysis of the ways in which the media, audience, and/or public has been variously conceptualized historically and theoretically. Grossberg, Hersfield, Hillis-Mowatt.

254 POLITICAL, INSTITUTIONAL, AND ECONOMIC CONTEXTS OF MEDIA AND CULTURE (3). Prerequisite, COMM 200. A detailed analysis of the relationship between government, policy making, corporate and business interests, and various theoretical approaches to their impact on media and culture. Fall.

255 HISTORY OF CULTURAL STUDIES (3). This course introduces cultural studies through its British "origins," especially but not only the work of the Centre for Contemporary Cultural Studies and the Open University.

258 STUDIES IN FILM AND TELEVISION (3). Graduate introduction to the study of film, television, and video. This course traces the theoretical and methodological development of media studies.

260 DIRECTING GROUP PERFORMANCE (3). Prerequisite, at least two performance courses at or over the 100-level. An in-depth examination of the theories and techniques of group performance.

261 NARRATIVE THEORY (3). This seminar recognizes and applies narrative theory in understanding texts, lives, and cultural practice broadly.

262 LITERATURE AND PERFORMANCE IN THE BLACK DIASPORA (3). Examination of Black diaspora studies, that is, colonial, post-colonial, and critical race theory, as illuminated by Black artists and literary expressions, particularly in Africa, the Caribbean, the Americas, and Europe.

269 TOPICS IN PERFORMANCE STUDIES (3). Prerequisite, second-year graduate students and/or consent of the instructor. Special problems in performance studies.

271 RHETORIC AND SOCIAL THEORY (3). This course will draw upon contemporary discussions in both rhetorical theory and critical social theory to explore a set of tensions in the western philosophical/political ideals of the public sphere and the political subject as a discursive agent within such public spaces and venues. Cox, Doxtader, Balthrop.

273 HISTORY OF RHETORIC (3). A critical survey of the history of rhetoric. Focus on classical and Enlightenment theories of rhetoric, with emphasis on problems of invention, persuasion, interpretation. Fall. Balthrop, Doxtader, Cox.

292 PHILOSOPHY OF COMMUNICATION AND CULTURE (3). Prerequisite, COMM 200. Considers the history of and developments in the philosophy of communication and culture as well as the role these concepts have played in Western philosophy. Spring. Grossberg, Doxtader.

298 TOPICS IN RESEARCH METHODS (3). Advanced study of selected topics in research methods. Topics vary.

322 SEMINAR IN FAMILY COMMUNICATION (3). This course is an advanced seminar in which students may study family communication and produce original research.

323 SEMINAR IN FEMINIST STUDIES IN COMMUNICATION (3). Prerequisite, COMM 229. This course compares and critically evaluates the work of major feminist scholars in the field of communication. Spring. Wood, Parker.

329 SEMINAR IN INTERPERSONAL AND ORGANIZATIONAL COMMUNICATION (3). A topic seminar that permits faculty and graduate students the opportunity to explore significant historical and emerging issues in the field of communication. Spring. May, Parker, Rosenfield, Wulman, Wood.

342 SEMINAR IN PERFORMANCE AND CULTURAL STUDIES (FOLK 342) (3). This course focuses on performance-related issues in the emergent field of cultural studies.

343 SEMINAR IN PROBLEMS IN CONTEMPORARY PERFORMANCE THEORY (FOLK 343) (3). An advanced seminar, this course will address recent developments and problems in performance theory. It will consider cross-disciplinary approaches to performance as sites for consideration and debate. Fall, spring. Pollock, Long, Madison.

344 SEMINAR IN PERFORMANCE AND HISTORY (3). This course explores diverse relations among performance and history, including the performance of life histories, the use of spectacle in history, everyday performances of historical protocols, and performance itself as a historical construct. Fall, spring. Pollock, Long, Madison.

345 THE POLITICAL ECONOMY OF PERFORMANCE (3). This course examines social relations, particularly power relations, by focusing on resistance and the performance of resistance arising from the dynamics and conflicts within specific locations of a political economy.

350 SEMINAR IN MEDIA STUDIES (3). Selected problems in media aesthetics. Exact topic to be covered is announced before classes begin.

351 SEMINAR IN CULTURE AND IDENTITY (3). This course looks at issues of the representation and production of identity, subjectivity, and agency in various forms in the practices of media.

352 SEMINAR IN THE HISTORY OF MEDIA (3). Application of historical research techniques to problems in the mass media. Exact topic is announced before classes begin. May be repeated.

353 SEMINAR IN POPULAR CULTURE (3). This course will look at special topics in the study of popular culture. Designed for advanced graduate studies, it will consider critical responses to existing scholarship with original research.

354 WRITING PROJECTS (3). Individual media writing projects accomplished with appropriate research, conference, and criticism. Departmental permission required.

355 SEMINAR IN CULTURAL STUDIES (3). Prerequisite, COMM 255 or equivalent. This class explores the impact of some developments in postmodernism - as an interpretive, historical, and philosophical discourse on the possible development of postmodern cultural studies.

356 SEMINAR IN COMMUNICATION TECHNOLOGY (3). Prerequisite, COMM 200. Examines new communication technologies, their spatial and social diffusion, and how these relate to theories of culture, politics, and technology and the real-world contexts in which technologies are received. May be repeated. Spring. Hillis-Mowatt.

357 SEMINAR IN CULTURAL STUDIES AND POPULAR CULTURE (3). Prerequisite, COMM 200. This course will focus on specific topics, issues, or queries of popular culture as these have been or can be studied within cultural studies. Fall. Grossberg, Johnson.

358 SEMINAR IN FEMINIST STUDIES OF FILM AND TELEVISION (WMST 358) (3). Prerequisite, graduate standing. This graduate seminar explores the-
tertial and practical points of contact between feminism, film, and television using psychoanalysis, narrative analysis, ideological analysis, and cultural studies. Spring.

359 SEMINAR IN MEDIA AND CULTURAL STUDIES (3). This course, designed for advanced graduate students, will explore specialized topics in interpretive, critical and cultural research in media studies.

360 TEACHING IN COMMUNICATION STUDIES (1). Prerequisite, must be Communication Studies graduate student. An introduction to teaching at the university level for new teaching assistants and graduate students hoping to have teaching-related responsibilities in communication studies. Fall.

371 SEMINAR IN CONTEMPORARY RHETORICAL THEORY (3). Advanced rhetorical theory. Special attention is paid to contemporary accounts of rhetorical invention, hermeneutics, political judgment, and symbolic action. Spring. Cox, D xoTrerxrer, r, r, f.


379 TOPICS IN Rhetorical and Cultural Studies (3). Prerequisite, COMM 211. Special problems in rhetorical and cultural studies.

390 RESEARCH PRACTICUM (1-3, repeatable to a maximum of 6). Prerequisite, permission of departmental coordinator of internships. Individualized practical experience supervised by a faculty adviser and by the departmental coordinator of internships. May be repeated once with approval of departmental faculty.

391 DIRECTED RESEARCH (3). Prerequisite, permission of the graduate faculty member involved. Individual research on a problem defined by the graduate student and graduate faculty member in conference. May be repeated once with permission of departmental graduate faculty.

392 RESEARCH PRACTICUM IN MEDIA AND CULTURAL STUDIES (3). Prerequisites, COMM 250, 251, permission of instructor. Individualized directed research by advanced students supervised by a member of the graduate faculty. May be repeated once with permission of graduate faculty. Fall, spring, summer. Grossberg, Hesfield, Hillis, Kindem.

393 MASTER'S THESIS (3 or 6). Fall and spring. Members of the graduate faculty.

394 DOCTORAL DISSERTATION (Var.).

399 RESEARCH PRACTICUM IN COMMUNICATION STUDIES (1-3). Individualized practical research. Fall, spring.

CURRICULUM OF COMPARATIVE LITERATURE
EDWARD DONALD KENNEDY, Chair

Professors
Dino Cervigni (44) Medieval and Renaissance Italian Literature, Auto biography
Lilian R. Furst (11) Nineteenth-Century Literature, Problems and Methods
William R. Harmon (17) Twentieth-Century American and British Poetry, Comparative Literature
Edward Donald Kennedy (4) Medieval Literature
Clayton Koell (5) Literary Criticism, Nineteenth- and Twentieth-Century German Literature
Alice A. Kuzniar (5) Romanticism, German Literature
John P. McGowan (92) Critical Theory
James L. Peacock (11) Anthropology, Symbolic Systems
Philip A. Stadler (16) Classical Historiography, Renaissance Latin

Associate Professors
Eric S. Downing (4) Eighteenth- and Nineteenth-Century Literature, Literary Theory, Classics
Diane R. Leonard (2) Modern Narrative, Modern Criticism and Theory
José Manuel Polo de Bernabé (54) Nineteenth- and Twentieth-Century Spanish Drama and Poetry, Critical Theory

Adjunct Professor
E. Jane Burns (1) Medieval French Literature, Feminist Theory
David J. Halpern (14) Judaism in Antiquity, Jewish Mysticism, Comparative Study of Judaism, Christianity, and Islam

Professors Emeriti
Paul Debevec
S. K. Heninger Jr.
George A. Kennedy
G. Mallory Masters
Richard A. Smyth

The graduate program in Comparative Literature stresses, from an international perspective, the exploration of styles, themes, genres, movements, literary theory, and literary criticism. Students take many of their courses in the cooperating literature departments and may choose among the rich offerings in the literatures of England, France, Germany, Ancient Greece and Rome, Italy, Portugal, Spain, Latin America, Russia, Asia, and the United States. Students in the Ph.D. program take courses in three national literatures, and they may choose a non-Western literature as the third literature.

Requirements for the M.A. include CMPL 201; two courses in the history of criticism covering together the period from the Greeks to the twentieth century; at least one course in literary theory and at least six courses in literature, ordinarily two in each of two national literatures and two from offerings in the curriculum; and successful completion of written examinations and a thesis. One theory or criticism course may be postponed until the student enters the Ph.D. program and another Comparative Literature course substituted for it.

Requirements for the Ph.D. program include the requirements for the M.A. or their equivalent taken at UNC-Chapel Hill or elsewhere; seven courses (counting those taken for the M.A.) in one national literature chosen to provide study of its historical development; five courses (counting those taken for the M.A.) in a second and third national literature (ordinarily distributed 3/2); and ten courses (counting those taken for the M.A.) from offerings in the curriculum. At least two of the courses should be seminars. Doctoral students are expected to develop one major and one minor track of special interest in some aspect of comparative studies through course work and independent reading. The Ph.D. written examination is devoted to these special interests. Among tracks currently available are medieval studies, Renaissance studies, feminist studies, folklore, history of criticism, literary theory, narrative studies, rhetoric, romanticism, realism, and naturalism; but students may request the approval of other tracks. The Ph.D. oral examination is devoted to discussion of the prospectus for a dissertation.

Courses for Graduates and Advanced Undergraduates
A. Period Courses
140 READING COURSE (Var.). Staff.

150 MAJOR WORKS OF TWENTIETH-CENTURY LITERARY THEORY (3). Comparative study of representative works on literary and cultural theory or applied criticism to be announced in advance. Koell, McGowan, Leonart.

170 THE MIDDLE AGES (3). Study of selected examples of Western medieval literature in translation, with particular attention to the development of varieties of sensibility in various genres and at different periods. Kennedy.

172 LITERATURE OF THE CONTINENTAL RENAISSANCE IN TRANSLATION (3). Discussion of the major works of Petrarch, Boccaccio, Machiavelli, Castiglione, Ariosto, Tasso, Rabelais, Ronsard, Montaigne, Cervantes, and Erasmus. Staff.
174 THE EIGHTEENTH-CENTURY NOVEL (3). English, French, and German eighteenth-century narrative fiction, with emphasis on the epistolary novel. Focuses on the relation of the novel to the Enlightenment and its counterpart, the cult of sentimentality; and on shifting paradigms for the family, education, gender, and erotic desire. Furst.

175 ROMANTICISM (3). An exploration of the period concept of romanticism using manifest and critical writings of the time, modern studies on the subject, and selected literary works. Furst.

176 REALISM (3). An exploration of the period concept of realism through selected novels and critical writings. Naturalism as an outgrowth of realism is also considered. Furst.

177 NATURALISM (3). The naturalist movement in European and American literature of the late nineteenth and early twentieth centuries, focusing on its philosophical, psychological, and literary manifestations in selected plays and novels. Furst.

178 MODERNISM (3). An exploration of the period concept of modernism in European literature, with attention to central works in poetry, narrative, and drama, and including parallel developments in the visual arts. Leonard.

181 AESTHETICISM (3). Aestheticism as a discrete nineteenth-century movement and as a major facet of modernism in literature and literary theory. Authors include Kierkegaard, Baudelaire, Nietzsche, Huysmans, Wilde, Mann, Rilke, Nabokov, Dinesen, Barthès, Sontag. Downing.

B. Genre Courses

180 CONCEPTS AND PERSPECTIVES OF THE TRAGIC (3). The history and theory of tragedy as a distinctive literary genre and as a more general literary and cultural problem. Authors include Aeschylus, Sophocles, Euripides, Shakespeare, Racine, Goethe, Nietzsche, Wagner, Mann, Samuel I and II, Faulkner. Also engages various theorists, ancient and modern. Downing.

184 THE DRAMA FROM IBSEN TO BECKETT (3). The main currents of European drama from the end of the nineteenth century to the present. (Offered irregularly.)


C. Special Topic Courses

190 LITERATURE AND THE ARTS OF LOVE (3). Love and sexuality in literary works from various historical periods and genres. Authors include Sappho, Plato, Catullus, Petrarca, Dante, Petrarch, Shakespeare, La Clos, Goethe, Nabokov, and Roland Barthes. Downing.

191 AUTOBIOGRAPHY AS A LITERARY FORM (3). The rise and evolution of interest in the self in literary forms from St. Augustine's to Rousseau's Confessions through Abelard, Dante, Petrarch, Cervantes, and Montaigne. Cervigni.


195 SPECIAL TOPICS IN COMPARATIVE LITERATURE (Var.). Staff.

Courses for Graduates

201 PROBLEMS AND METHODS IN COMPARATIVE LITERATURE (3). The course deals with the history of comparative literature, bibliographical materials, orientations of the subject in Europe and America, and problems of methodology, periodization, literary movements, and concepts of literary theory. Fall. Furst.

202 TOPICS IN CONTEMPORARY LITERARY AND CULTURAL THEORY (3). Selected critical topics in poststructuralist thought, chosen by the instructor and announced in advance. (Alternate years.) Polo de Bernabé.

221 READING IRONIES (3). Study of processes of recognizing and constructing ironies in texts, with consideration of both theoretical issues and practical readings. Furst.

240 READING COURSE (Var.). Staff.

241 HISTORY OF LITERARY CRITICISM I: CLASSICISM (3). Study of Platonism, Aristotelianism, Ciceroianism, and Horatianism as critical traditions from antiquity to the eighteenth century. (Alternate years.) Downing.

242 HISTORY OF LITERARY CRITICISM II: 1750-1950 (3). Study of major theoretical and critical writings in Europe from the middle of the eighteenth to the early twentieth centuries. (Alternate years.) McGowan or Koebel.

243 TWENTIETH-CENTURY LITERARY THEORY (3). An overview of major theoretical developments of the twentieth century, including such movements as Saussurean linguistics, Russian Formalism, Prague Circle Semiotics, post-structuralism, phenomenology, psychoanalysis, feminism, and Marxism. (Alternate years.) Koebel, Leonard.

295 SPECIAL TOPICS IN COMPARATIVE LITERATURE (3). Fall or spring. Staff.

309 INTERDISCIPLINARY SEMINAR IN RENAISSANCE STUDIES (3). Topic announced annually in advance. Required of students minoring in Renaissance Studies; see Doctor of Philosophy Degree with a Minor in Renaissance Studies. Staff.

310 SEMINAR (3). Topic announced annually in advance. Staff.

393 MASTER'S THESIS (Var.). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (Var.). Fall and spring. Staff.

395 RESEARCH. Staff.

Cross-Listed Courses

104 (Romance Languages 104; Peace, War, and Defense 190) VIOLENCE AND RELIGION IN LITERATURE FROM EPIC TO NOVEL (3). 135 (Anthropology 135) CONSCIOUSNESS AND SYMBOLS (3). Peacock.

142 (Philosophy 142) PHILOSOPHY IN LITERATURE (3).

153 (English 153) MEDIEVAL ROMANCE (3). Kennedy.

179 (English 179) LITERATURE OF THE AMERICAS (3).

235 (Classics 235) CLASSICAL CRITICISM (3).

Doctor of Philosophy Degree with a Minor in Renaissance Studies

Students working on their doctorate in one of the regular departmental programs may, with the approval of their departmental director of graduate studies, submit for the degree an interdisciplinary minor in Renaissance Studies. The program is based in the Curriculum of Comparative Literature and administered by the Arts and Sciences Committee for Renaissance Studies. The minor requires a minimum of five courses. Of those five, one must be Comparative Literature 309. Seminar in Renaissance Studies. The remaining four courses must represent equally two fields other than the major field (e.g., a student with a major in Italian could offer from the approved list two courses in French, two in Latin, and CMPL 309).

CMPL 309 (Seminar in Renaissance Studies) serves as a nucleus for the minor, affording students the opportunity to bring together seemingly divergent strains in an interdisciplinary context. Normally the faculty member giving the course invites other members of the Renaissance faculty to participate in the discussions and to present related materials from their own field of inquiry. Student participants choose a related topic or area for
research and all report regularly on their own projects under investigation. The course is cross-listed as appropriate, under departmental offerings. The minor in Renaissance Studies for the Ph.D. is examined orally at the departmental oral examination (not the defense), unless written examination is required by departmental policy; normally faculty with whom the candidate has taken courses serve as examiners.
A working knowledge of Latin is strongly recommended for students in the program.

**Master of Arts Degree with a Minor in Renaissance Studies**

Students working on their M.A. in one of the regular departmental programs may also, with the approval of their departmental director of graduate studies, submit for the degree an interdisciplinary minor in Renaissance Studies. The program, like that for the Ph.D., is in the Curriculum of Comparative Literature and is administered by the Arts and Sciences Committee for Renaissance Studies. The minor requires a minimum of three courses. The three courses must be from the offerings of two fields other than the major field. The minor in Renaissance Studies at the M.A. level should encourage students to broaden their program early and should prepare them for continued interdisciplinary work at the doctoral level. It is not designed for terminal M.A.'s.

**Faculty in Renaissance Studies and Related Areas**

**Art History:** Mary Pardo, Jaroslav Fiedl

**Classics:** Philip Stadler

**English:** Christopher Armitage, Reid Barbour, Alan Dessen, Ritchie Kendall, Darryl Gless, Megan Machitskie, Jessica Wolfe

**History:** Melissa M. Bullard, Barbara Harris, John Headley, Michael McVaugh, Jay Smith

**Music:** James Hatt, John Nadas, Thomas Warburton

**Religious Studies:** Peter Kaufman

**Romance Languages:** Lucia Binetti, Dino Cervigni, Angel L. Cifern, Frank Dominguez, Ennio I. Rao, Frederick Vogler

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**DEPARTMENT OF COMPUTER SCIENCE**

**STEPHEN F. WEISS, Chair**

**Professors**


Frederick P. Brooks Jr. (9) 3D Interactive Computer Graphics, Human-Computer Interaction, Virtual Worlds, Computer Architecture, the Design Process

Praun Dewan (63) User Interfaces, Distributed Collaboration, Software Engineering Environments, Object-Oriented Databases, Mobile Computing

Henry Fuchs (11) High-Performance Graphics Hardware, 3D Medical Imaging, Head-Mounted Displays, Virtual Environments

Guido Gerig (75) Image Analysis, Shape-Based Object Recognition, 3D Object Representation and Quantitative Analysis, Medical Image Processing

John H. Halton (26) Applications of Combinatorial and Probabilistic Methods and of Scientific and Mathematical Analysis to Computational, Scientific, and Engineering Problems


David A. Plaisted (28) Mechanical Theorem Proving, Term Rewriting Systems, Logic Programming, Algorithms

Jan F. Prins (33) Parallel Algorithms, Languages, and Architectures, High-Level Programming Languages, Compilers, Formal Techniques in Program Development, Algorithms for Structural Biology and Bioinformatics


Stephen F. Weiss (10) Information Storage and Retrieval, Natural Language Processing, Communications and Distributed Systems, Computer-Supported Cooperative Work

**Associate Professors**


Kye S. Hladun (22) Computer-Aided Design, Computer Architecture, Algorithm Design and Analysis, Parallel Processing

Anselmo A. Lastra (52) Interactive 3D Computer Graphics, Hardware Architecture for Computer Graphics

Ming C. Lin (72) Physically Based and Geometric Modeling, Applied Computational Geometry, Robotics, Distributed Interactive Simulation, Virtual Environments, Algorithm Analysis

David Scotts (59) Computer-Supported Cooperative Work, Hypermedia, Software Engineering and Formal Methods, Programming Languages and Concurrency, Interoperable Distributed Systems

**Assistant Professors**

Kiran Mayer-Patil (80) Multimedia Systems, Networking, Multicast Applications

Manitek Singh (84) High-Performance and Low-Power Digital Systems, Asynchronous Circuits and Systems, System-on-a-Chip Design, VLSI CAD

**Research Professor**

P. Donelson Smith (42) Computer Networks, Operating Systems, Distributed Systems, Multimedia, Computer-Supported Cooperative Work

**Research Associate Professors**


Russell M. Taylor II (69) 3D Interactive Computer Graphics, Virtual Worlds, Distributed Computing, Scientific Visualization, Human-Computer Interaction

Gregory F. Welch (71) Human-Machine Interaction, 3D Interactive Computer Graphics, Virtual/Augmented Environment Tracking Systems, Shared Virtual Environments and Telecollaboration

**Research Assistant Professor**

Mary C. Whiston (81) Virtual and Augmented Reality Systems for Data Visualization, Computer Graphics System Architectures

**Lecturers**


Timothy L. Quigg (83) Intellectual Property Rights, Industrial Relations, Contract Management, Research Administration

Leandra Vicci (35) Information Processing Hardware: Theory, Practice, Systems, and Applications

Jeanie M. Walsh (56) Computer Education, Social, Legal, and Ethical Issues Concerning Information Technology
Adjunct Professors
Hussein Abdel-Wahab (55) Computer-Supported Cooperative Work, Multimedia Systems and Communications, Distance Learning, Distributed Systems, Operating Systems, Networking
Pankaj K. Agarwal, Computational and Combinatorial Geometry, GIS and Global Change, Computational Biology, Robotics, Visualization
Elizabeth Baulist, Computer-Aided Surgery, Computer-Aided Diagnosis
Herbert Edelesbrunner, Algorithms, Data Structures, Discrete and Computational Geometry, Combinatorial and Computational Topology, Geometric Modeling, Structural Biology
Sean Walshburn, Condensed Matter Physics, Materials Science

Adjunct Associate Professors
Siddhartha Chatterjee (68) High-Level Programming Languages, Compilation for Highly Parallel Machines, Object-Oriented Programming, Parallel Algorithms and Architectures
Richard St. John, Condensed Matter Physics, Biophysics, Microscopy

Adjunct Assistant Professors
Stephen R. Aylward (73) Computer-Aided Diagnosis, Computer-Aided Surgical Planning, Statistical Pattern Recognition, Image Processing, Neural Networks
Bert Denney (76) Computer-Supported Cooperative Work, Computer Networks, Multimedia Communications, Digital Library Systems
Sarat C. Joshi, Image Analysis, Medical Image Processing, Computer Vision, Computational Anatomy

Adjunct Research Professor
Nicholas England (67) Systems Architecture for Graphics and Imaging, Scientific Visualization, Volume Rendering, Interactive Surface Modeling
John Poulton (32) Graphics Architectures, VLSI-Based System Design, Design Tools, Rapid System Prototyping

Adjunct Research Associate Professor
John G. Eyles (38) Graphics Architectures, Rapid System Prototyping, Virtual Environments, VLSI-Based System Design

Professors Emeriti
Peter Cushing
Gyula A. Magó
Donald F. Stanat

The Department of Computer Science at UNC-Chapel Hill was one of the first in the United States to be established as an independent department, in 1964. Its primary missions are research and graduate and undergraduate teaching. Research particularly emphasizes:
- algorithms and complexity theory;
- computer architectures;
- computer graphics and image analysis;
- computer-supported cooperative work;
- distributed systems;
- geometric modeling and computation;
- hardware systems and design;
- human-machine interaction;
- hypertext;
- the Monte Carlo method;
- multimedia systems;
- networking;
- parallel computing;
- programming language design and implementation;
- real-time systems;
- software engineering and environments; and
- theorem proving and term rewriting.

The M.S. and Ph.D. curricula are oriented toward the design and application of computer systems and toward that portion of theory that guides and supports practice. The Ph.D. program prepares teachers and researchers for positions with universities, government research laboratories, and industry. Academic employment ranges from four-year colleges, where teaching is the primary focus, to positions at major research universities. The M.S. program prepares highly competent and broadly skilled practitioners. A majority of the master's graduates work in industry, in companies ranging from small start-up operations to government labs and large research and development corporations.

Most of the department's approximately 130 graduate students are full time. Students contribute to nearly every aspect of the department's operation. In addition to taking a wide variety of courses, they have the opportunity to participate in groundbreaking research, to teach, to attend research group meetings, and to serve on committees that affect all aspects of life in the department.

The Computer Science Student Association sponsors both professional and social events and represents the students in departmental matters. Its president is a voting member at faculty meetings.

Facilities
Sitterson Hall, opened in 1987, provides seventy-four thousand square feet of sophisticated, state-of-the-art research facilities and office space for all members of the department. The building is organized in "clusters" to create research communities featuring shared laboratories and open conferencing areas to facilitate interaction among students and faculty. The building contains the 60-seat C. Hugh Holman video teleconference, a 125-seat auditorium; the Lib Moore Jones Faculty Conference Room; a reading room; and various research laboratories, conference areas, and study areas.

Graduate students have access to all of the department's research and teaching facilities, including specialized research laboratories for graphics and image processing, computer building and design, and collaborative, distributed, and parallel systems. The laboratories, offices, conference areas, and classrooms are bound together by the department's fully integrated, distributed computing environment.

General Computing Environment
The department's computing environment includes almost six hundred computers, ranging in performance from twelve million instructions per second (MIPS) to more than twenty-five billion instructions per second (BIPS). These systems are integrated by means of high-speed networks and by software that is consistent at the user level over the many architectural platforms. In addition, the department's research laboratories contain specialized equipment and facilities.

General computing systems include approximately 470 Intel-based personal computers, 20 SGI computers, 30 Sun workstations, 20 HP workstations, and 50 Apple Macintosh systems. Main memory on each computer ranges from 16 megabytes to 16 gigabytes. Total disk space exceeds 7.5 terabytes. Output facilities include laser printers, color printers and plotters, and slide makers.

The parallel computing facilities include several parallel SGI Onyx and Power Onyx machines, a Reality Monster, a 32-processor SGI Onyx2(TM) Infinite Reality2(TM) workstation, and several Sun multiprocessor systems.
The primary software environment consists of the UNIX(r) operating system, Microsoft Windows NT, Andrew File System (AFS), and the X Window System. Languages most commonly used include C++, Java, C, and Turing. Document preparation is usually accomplished via PC and Macintosh systems. The department's extensive software holdings are continually evolving.

The department's computer systems are connected to one another by a high-speed data network running over Ethernet and FDDI. The department is currently upgrading its building network to provide switched 100-megabit/second connections to every desktop by sometime in 2002. The department's extensive network reaches into each office to provide voice, data, and video networking capabilities. The campus Ethernet connection provides extended Ethernet service to the Internet and to other facilities on campus, and it connects the department to the North Carolina Research and Education Network (NC-REN), allowing users to reach any network in the world. NC-REN is a statewide network that links research and educational institutions. The department's two-way video classroom and teleconference room allow connection to any institution served by the network. Courses are shared among the institutions via two-way, interactive video teleclassing. NC-REN substantially widens the course, concentration, and advising opportunities available to students at participating universities. The network in Sitton Hall also incorporates a satellite earth station.

Every student is assigned to a two- or three-person office. Each student is assigned a computer.

**Libraries**

Students have access to the entire University library system, which includes a major academic library and several satellite libraries containing almost 5 million books and periodicals, as well as to libraries at NC State and Duke universities with a unified on-line searching capability. The Brauer Library, next door in Phillips Hall, is a satellite library with extensive holdings in mathematics, physics, statistics, operations research, and computer science.

**Degree Requirements**

**Graduate Curriculum**

A flexible course of study for the M.S. and Ph.D. degrees focuses on areas of choice and accommodates differences in students' backgrounds. The two degree programs share a basic distribution requirement of four courses chosen from theoretical, systems, and applied subject areas. The Ph.D. program includes work in specialized areas, preparation for teaching, and active involvement in advanced research.

**Master of Science**

An M.S. candidate must earn 30 semester hours of credit in courses numbered 100 or higher, of which up to 6 hours may be transferred from another institution or graduate program, and of which 18 hours must be completed in the Computer Science Department. Satisfactory completion of the distribution requirement provides 12 hours of credit. The remaining credits are earned in areas of specific interest, and may include course work, as needed, to address the following requirements:

* The technical writing requirement may be satisfied in one of three ways: (1) by taking the technical writing course, COMP 291, (2) by writing a thesis, or (3) by writing a technical document in either academic or nonacademic work that has been reviewed and accepted (this may include a previously written thesis or dissertation).

* The program product requirement may be satisfied by taking the software engineering course, COMP 145, or by presenting satisfactory documentation of previous experience with the development of a significant software system.

* The background preparation requirement reflects the body of material that is prerequisite to the department's graduate courses. Courses needed, if any, to satisfy this requirement are decided in consultation with the candidate's advisor, course instructors, and the graduate studies committee.

A thesis is optional; if one is written, it counts for six hours. A comprehensive exam is required and has two possible forms: (1) satisfactory completion of an integrative paper (this also satisfies the technical writing requirement when written as part of COMP 291), or (2) an oral exam covering material from the courses in the candidate's program of study. While either exam is sufficient for the M.S. program, the integrative paper is required for the Ph.D. program. A student with an assistantship generally completes the M.S. degree in four semesters or less.

**Doctor of Philosophy**

Admission to the Ph.D. program is by oral qualifying examination and recommendation of the faculty. There is no credit hour requirement for the Ph.D. program, but a Ph.D. candidate must complete courses to satisfy the distribution requirement and any needed background preparation, and must write an integrative paper. A Ph.D. candidate proposes an individual program of study, typically 15 to 18 hours. The program of study includes a primary and secondary concentration in computer science, training in mathematics, and a supporting program of external courses or a foreign language. Previous course work can be used to satisfy much of the program of study. A candidate must also satisfy the program product requirement, teach a course, participate in the technical communication seminar, pass an oral examination in the proposed dissertation area, and submit and defend a dissertation that presents an original contribution to knowledge. The normal time needed to complete the degree by a full-time student with an assistantship is five years.

**Distribution Requirement**

The distribution requirement requires satisfactory completion of four courses from the list below, with at least one course from each area. Grades earned in these four courses must satisfy additional requirements according to the degree program (M.S. or Ph.D.)

**Formal**

COMP 202: Algorithm Analysis
COMP 244: Programming Languages
COMP 247: Distributed and Concurrent Algorithms
COMP 250: Scientific Computation

**Systems**

COMP 204: Software Design and Implementation
COMP 240: Compilers
COMP 242: Operating Systems
COMP 243: Distributed Systems

**Applied**

COMP 203: Parallel and Distributed Computing
COMP 206: Computer Architecture and Implementation
COMP 235: Images, Graphics, and Vision
COMP 261: Elements of Hardware Systems

**Integrative Paper**

An integrative paper is a survey of three or more technical papers that span multiple sub-fields of computer science and have a common thread. The integrative paper is written in one semester and is organized as an issue-based survey of approximately 5,000 words, emphasizing the integration of concepts found in the subject papers. Faculty members can suggest suitable collections of papers, but students may propose a collection of sub-
ject papers as well. Two faculty members must agree to read the integrative paper for style and content. The student follows a schedule of milestones for drafts and revisions. Both faculty members must accept the final revision for the integrative paper requirement to be satisfied. Concurrent registration in the technical writing class, COMP 291, is recommended but not required. The satisfactory completion of an integrative paper satisfies the technical writing requirement.

Admissions and Financial Aid

Admission to the department is highly competitive. Although the department welcomes promising students from all disciplines, entering students must have a substantial background in both mathematics and computer science. This background normally includes at least six semester courses in mathematics and six in computer science. The department considers knowledge of the following subjects to be essential preparation for the graduate program:

- differential and integral calculus;
- discrete mathematics: sets, relations, functions, algebra;
- linear algebra or matrix theory;
- mathematical probability, preferably calculus-based;
- structured programming techniques;
- data structures and abstract data types; and
- computer organization.

Most entering students have studied all but two or three of the following subjects, which are required preparation for the graduate program:

- design and analysis of algorithms;
- formal languages and automata theory;
- databases;
- operating systems;
- compilers;
- digital logic techniques;
- numerical computing methods;
- programming languages; and
- software engineering.

Students who are admitted but who have not completed all the requirements must complete them after admission. Preference is given to applicants who are solidly prepared, especially in mathematics.

Previous Degrees. A baccalaureate degree is required, with a grade point average of at least B (3.0/4.0); most entering students have a GPA of more than 3.5.

GRE. High scores on all three parts of the General Aptitude Test of the Graduate Record Examination are also recommended: a minimum of 80th percentile on the verbal and 90th percentile on the quantitative and analytical sections is recommended. In recent years, most entering students have averaged in the 90th percentile or higher on each of the three sections. Allowances are made in interpreting the verbal test scores of applicants whose native language is not English. Although GRE Advanced Test scores are not required, applicants are encouraged to take the advanced test in computer science, mathematics, engineering, or physics, as appropriate.

TOEFL. Applicants whose native language is not English must submit TOEFL scores. The department gives preference to applicants who score above 640.

Personal Statement. Each applicant must submit a short personal statement directly to the department. The statement should include:

- objectives in pursuing graduate study;
- identification of fields within computer science in which the applicant has a particular interest;
- information that is relevant to the applicant’s qualifications for graduate study but that has not been included already in the application (e.g., major academic projects, papers presented or published, and nonacademic computer experience);
- an informative title or a brief description of any course listed on the applicant’s transcript without a title (or with a vague title such as “Mathematics II”);
- a list of courses taken or planned that do not yet appear on a transcript; and
- an e-mail address, if available.

Please type the statement, if possible. It should be between a half page and two pages long.

Recommendations. Three letters of recommendation are required. Letters written by an applicant’s present or former professors are usually more informative than those written by employers or colleagues.

Sponsorship. Because of the large number of applicants, the department’s faculty members are unable to provide individual assessments of an applicant’s chances for admission. Applicants cannot improve their chances of admission by finding a faculty sponsor within the department, because all admissions decisions are made by a faculty committee that reviews all applications, ranks the applicants by overall merit, and makes decisions on admission and financial support based on the application material submitted. In particular, students are not admitted by research project directors; contacting individual faculty members whose research is of interest has no effect on one’s chances of being admitted.

How to Apply. Admission is based solely on merit. The University of North Carolina is an affirmative action, equal opportunity institution. Prospective applicants who clearly surpass the minimum requirements are encouraged to write for application materials to: The Graduate School, CB# 4010, 200 Bynum Hall, UNC-Chapel Hill, Chapel Hill, NC 27599-4010. Telephone: (919) 966-2611. Web: gradschool.unc.edu. The Graduate School’s web site includes information on applying and on-line application forms. Domestic applicants (U.S. citizens and resident aliens) should check www.ais.unc.edu/sis/admissions/grad/domadm.html. International applicants should refer to www.ais.unc.edu/sis/admissions/grad/intladm.html.

Financial Support. During the academic year, most computer science students are supported by assistantships and fellowships. The stipend for research and teaching assistantships for the nine-month academic year 2002-2003 will be $13,880 (20 hours a week). Also, at no cost to them, students are covered by a comprehensive major medical insurance program, underwritten by Blue Cross/Blue Shield of North Carolina. Full-time summer employment on a research project is normally available to students who would like to receive support. The rate for summer 2002 will be $700 per week (40 hours) for 10 to 12 weeks. This will produce a combined annual financial package for our graduate assistants of approximately $22,280. Students with assistantships qualify for a Graduate Student Tuition Grant and pay no tuition. They are, however, responsible for paying student fees of approximately $470 per semester. Graduate Student Tuition grants typically cover M.S. students for four semesters of study and Ph.D. students for ten semesters of study. Annual living costs for single graduate students in the Chapel Hill area are estimated to be $12,000 or higher. On-campus housing is available for both single and married students.

The department provides a $500 educational fund each semester to any student who receives a competitive fellowship not granted by UNC-Chapel Hill. The fund may be used for education-related expenses including books, journals, travel, computer supplies and accessories, and professional memberships. The department also awards a $1,500 supplement each semester to nonservice fellowship holders who join a research team.
To apply for an assistantship, the applicants should check the appropriate item on the admissions application form. Applicants for assistantships are automatically considered for all available fellowships. Students can expect continued support, contingent on satisfactory work performance and academic progress.

Students are not assigned to specific research projects or teaching assistant positions immediately upon being admitted to the department. Assignments are made just prior to the start of each semester, after faculty members and students have had an opportunity to meet and to discuss their interests. Students are encouraged to gain professional experience through summer internships with companies in the Research Triangle area or in other parts of the country.

**Deadlines.** The fall semester runs from mid-August to mid-December; the spring semester from early January to early May. Graduate courses in computer science are not offered routinely during the summer. Applications for fall admission, complete with a personal statement, all transcripts, and recommendations should be received by the Graduate School no later than January 1. To ensure meeting that deadline, applicants should take the Graduate Record Examination (GRE) no later than December. Early submission of applications is encouraged. A few assistantships are sometimes available for those who wish to begin in the spring semester. Applicants for spring admission should submit completed applications no later than October 15 and take the GRE no later than June. International applicants should complete their applications earlier to allow time for processing financial and visa documents.

For more information, write to the Director of Graduate Admissions, Department of Computer Science, CB# 3175, Sutton Hall, Chapel Hill, NC 27599-3175, or send electronic mail to admset@cs.unc.edu. Interested persons are encouraged to visit the department's website, www.cs.unc.edu.

**Courses**


117 **INTRODUCTION TO WWW PROGRAMMING** (3). Prerequisite, COMP 114 or equivalent experience. Client-side programming in Java for the WWW. Introduction to TCP/IP, HTTP, and WWW architecture. Emphasis on exploiting and componentizing networked computing using threads, simple client-server applications, and XML. Fall. J. Smith, Mayer-Partel, Dewan.

118 **ADVANCED WWW PROGRAMMING** (3). Prerequisite, COMP 117. Server-side programming in Java for the WWW. Emphasis on exploiting and componentizing networked computing using APIs for object serialization, remote method invocation, database connectivity, and XML generation. Spring. J. Smith, Mayer-Partel, Dewan.

120 **COMPUTER ORGANIZATION** (3). Prerequisite, COMP 114. Digital logic, circuit components. Data representation, computer architecture and implementation, assembly language programming. Fall and spring. Coggin, Bishop, Fuchs.

121 **DATA STRUCTURES** (4). Prerequisite, COMP 114. The analysis of data structures and their associated algorithms. Abstract data types, lists, stacks, queues, trees, and graphs. Sorting, searching, hashing. Fall and spring. Hedlund, staff.


130 **FILES AND DATABASES** (3). Prerequisites, COMP 120, 121, MATH 81. Placement of data on secondary storage. File organization. Database history, practice, major models, system structure and design. Fall. Stotts, Wei.

134 **VISUALIZATION IN THE SCIENCES** (3). Computational visualization applied in the natural sciences. For both computer science and natural science students. Available techniques and their characteristics, based on human perception, using software visualization tools. Project course. Fall. Taylor.

136 **INTRODUCTION TO COMPUTER GRAPHICS** (3). Prerequisites, COMP 121, MATH 147. Hardware, software, and algorithms for computer graphics. Scan conversion, 2-D and 3-D transformations, object hierarchies. Hidden surface removal, clipping, shading, and antialiasing. Not for graduate Computer Science credit. Fall. Staff.


142 **OPERATING SYSTEMS** (3). Prerequisites, COMP 120, 121. Types of operating systems. Concurrent programming. Management of storage, processes, devices. Scheduling, protection. Case study. Students implement significant components of a small operating system. Fall. (Alternate years) Jeffay.

144 **PROGRAMMING LANGUAGE CONCEPTS** (3). Prerequisite, COMP 121. Concepts of high-level programming and their realization in specific languages. Data types, scope, control structures, procedural abstraction, classes, concurrency. Run-time implementation. Spring. Staff.

145 **SOFTWARE ENGINEERING LABORATORY** (3). Prerequisites, COMP 120, 121. Organization and scheduling of software engineering projects, structured programming and design. Each team designs, codes, and debugs program components and synthesizes them into a tested, documented program product. Spring. Stotts.

170 **APPLICATIONS OF NATURAL LANGUAGE PROCESSING** (INLS 170) (3). Prerequisite, COMP 14, 15, or 16. See course listings for School of Information and Library Science.

171 **NATURAL LANGUAGE PROCESSING** (INLS 115) (3). Prerequisite, COMP 14, 15, or 16. See course listings for School of Information and Library Science.

172 **INFORMATION RETRIEVAL** (INLS 172) (3). Prerequisite, COMP 14, 15, or 16. See course listings for School of Information and Library Science.


190 **TOPICS IN COMPUTER SCIENCE** (1-3). Prerequisite, permission of the instructor. This course has variable content and may be taken multiple times for credit. Fall and spring. Staff.


220, 221 MATHMATICAL THEORY FOR COMPUTER SCIENCE (Variable. 0.5-5 each). Open to computer science graduate students only. Modules of mathematics for use in computer science. Includes principles of analysis, probability, linear algebra, modern algebra, logic. Fall and spring. Staff.

222, 223 PROGRAMMING LANGUAGES AND TECHNIQUES (Variable. 0.5-5 each). Open to computer science graduate students only. Modules presenting programming tools. Includes programming and command languages, data representation, data structures, file organizations, search sorts. Fall and spring. Staff.

224, 225 MATHMATICAL MODELS IN COMPUTER SCIENCE (Variable. 0.5-5 each). Open to computer science graduate students only. Modules developing mathematical models of computers, algorithms, and information in computers. Applications of these models includes theories of switching, automata, computability, formal languages, coding, information, numerical analysis. Fall and spring. Staff.

226, 227 COMPUTER SYSTEMS (Variable. 0.5-5 each). Open to computer science graduate students only. Modules on hardware and software making up computer systems. Includes device technology, computer architecture and implementation, data communications, systems evaluation, language processors, control programs, business data processing, software engineering. Fall and spring. Staff.


230 DATABASE MANAGEMENT SYSTEMS (3). Prerequisites, COMP 122, 130. Database management systems, implementation, and theory. Query languages, query optimization, security, advanced physical storage methods and their analysis. (On demand.) Staff.

231 INTRODUCTORY COMPUTER GRAPHICS (1). Prerequisites, COMP 121, MATH 83. Selected material from an Introduction to Computer Graphics, providing remedial introduction for COMP 236. Hardware, software, and algorithms for computer graphics. Fall. Coggins, Bishop, Brooks, Fuchs, Lin, Manocha, Pizer.


233 DISCRETE EVENT SIMULATION (ORS 233) (3). See course listings for Department of Operations Research.


236 COMPUTER GRAPHICS (3). Prerequisites, COMP 231, 235. Study of graphics hardware, software, and applications. Data structures, graphics, languages, curve surface and solid representations, mapping, ray tracing and radiosity. Spring. Bishop, Brooks, Fuchs, Lin, Manocha.

238 ADVANCED IMAGE SYNTHESIS (3). Prerequisite, COMP 236. Advanced topics in rendering, including global illumination, surface models, shading, graphics hardware, image-based rendering, and antialiasing techniques. Topics from the current research literature. Fall. (Alternate years.) Lauriz.

239 EXPLORING VIRTUAL WORLDS (3). Prerequisite, COMP 238. Project course, lecture, and seminar on real-time interactive 3D graphics systems in which the user is immersed in and interacts with a simulated 3D environment. Hardware, modeling, applications, multi-user systems. (Alternate years.) Fuchs, Brooks.


241 INTERNET ARCHITECTURE AND PERFORMANCE (3). Prerequisite, COMP 123 or permission of instructor. Internet structure and architecture; traffic characterization and analysis; errors and error recovery; congestion and congestion control; services and their implementations; unicast and multicast routing. Spring. (Alternate years.) Jeffay, F. D. Smith, Mayer-Patel.

242 OPERATING SYSTEMS (3). Prerequisite, COMP 142. Theory, structuring, and design of operating systems. Sequential and cooperating processes. Single processor, multiprocessor, distributed operating systems. Spring. Dewan, Jeffay, F. D. Smith, Mayer-Patel.

243 DISTRIBUTED SYSTEMS (3). Prerequisite, COMP 123 or permission of instructor. Design and implementation of distributed computing systems and services. Inter-process communication and protocols; naming and name resolution; security and authentication; scalability; high availability; replication; transactions; group communications; distributed storage systems. Fall. Dewan, Jeffay, F. D. Smith.


245 FUNCTIONAL PROGRAMMING (3). Prerequisite, COMP 144. Programming with functional or imperative languages. Lambda calculus; combinations; higher-order functions; infinite objects. Least fixed points, semantics, evaluation orders. Sequential and parallel execution models. (On demand.) Prins, Plaisted.

246 LOGIC PROGRAMMING (3). Prerequisite, COMP 144. Propositional calculus, Horn clauses, first-order logic, resolution. Prolog: operational semantics, relationship to resolution, denotational semantics, and non-logical features. Programming and applications. Selected advanced topics. (On demand.) Plaisted.

247 DISTRIBUTED AND CONCURRENT ALGORITHMS (3). Prerequisites, COMP 203, 204. Verification of concurrent systems. Synchronization; mutual exclusion and related problems, barriers, rendezvous, blocking and nonblocking algorithms. Fault tolerance: consensus, Byzantine agreement, self-stabilization, broadcast algorithms. Termination and deadlock detection. Clock synchronization. (Alternate years.) Anderson.


255 RECENT ADVANCES IN IMAGE ANALYSIS (3). Prerequisite, COMP 254. Lecture and seminar on recent advances in image segmentation, registration, pattern recognition, display, restoration, and enhancement. Spring. (Even-numbered years) Pizer, Coggins, Gerig.


257 VISUAL SOLID SHAPE (MATH 278) (3). Prerequisites, MATH 33, 116, 3-D differential geometry, local and global shape properties, visual aspects of surface shape. Taught largely through models and figures. Applicable to graphics, computer vision, human vision, and biology. Fall. (Alternate years) Pizer.

258 GEOMETRIC AND SOLID MODELING (3). Prerequisites, COMP 136 or 236, MATH 191 or COMP 205. Curve and surface representations. Solid models. Constructive solid geometry and boundary representations. Robust and error-free geometric computations. Modeling with algebraic constraints. Applications to graphics, vision, and robotics. (Alternate years) Manocha.

259 PHYSICALLY BASED MODELING AND SIMULATION (3). Prerequisites, COMP 205, 235, or permission of the instructor. Geometric algorithms, computational methods, simulation techniques for modeling based on mechanics and its applications. (Alternate years) Lin.

261 ELEMENTS OF HARDWARE SYSTEMS (3). Prerequisite, COMP 120. Issues and practice of information processing hardware systems for computer scientists with little or no previous hardware background. System thinking, evaluating technology alternatives, basics of electronics, signals, sensors, noise and measurements. Spring. Bishop, Viciu.

265 ADVANCED COMPUTER ARCHITECTURE (3). Prerequisite, COMP 206. Concepts and evolution of computer architecture, machine language syntax and semantics, data representation, naming and addressing, arithmetic, control structures, concurrency, input-output systems and devices. Millstone architectures. (Alternate years) Brooks.

267 ADVANCED COMPUTER IMPLEMENTATION (3). Prerequisites, COMP 206, knowledge of digital logic techniques. The application of digital logic to the design of computer hardware. Storage and switching technologies. Mechanisms for addressing, arithmetic, logic, input/output, and storage. Microprogrammed and hard-wired control. (On demand) Staff.

268 VLSI SYSTEMS DESIGN (3). Prerequisites, COMP 206, knowledge of digital logic techniques. Introduction to the design, implementation and realization of very large-scale integrated systems. Each student designs a complete digital circuit that will be fabricated and returned for testing and use. Spring. Hedlund.

269 ADVANCED DESIGN OF VLSI SYSTEMS (3). Prerequisite, COMP 268. Advanced topics in the design of digital MOS systems. Students design, implement, and test a large custom integrated circuit. Projects emphasize the use of advanced computer aided design tools. (Alternate years) Staff.


277 VISUAL PERCEPTION (PSYC 289) (3). Prerequisites, COMP 235 (vision segment), PSYC 209A, or equivalent. Surveys form, motion, depth, scale, color, brightness, texture, and shape perception. Includes computational modeling of vision, experimental methods in visual psychophysics and neurobiology, recent research, and open questions. Fall. (Alternate years) Pizer.

281 COMPUTATIONAL GEOMETRY (3). Prerequisite, undergraduate analysis of algorithms course (e.g., COMP 122) or permission of instructor. Design and analysis of algorithms and data structures for geometric problems. Applications in graphics, CAD/CAM, robotics, GIS, and molecular biology. Fall. (Odd years) Snoeyink, Lin.


286 TOPICS IN DISCRETE OPTIMIZATION (ORSA 216) (3). See course listings for Department of Operations Research.

288 INFORMATION THEORY (STAT 252) (3). See course listings for Department of Statistics.

289 ERROR-CORRECTING CODES (STAT 253) (3). See course listings for Department of Statistics.

290 TOPICS IN COMPUTER SCIENCE (1-3). Prerequisite, permission of the instructor. This course has variable content and may be taken multiple times for credit. Fall and spring. Staff.


312 TECHNICAL COMMUNICATION IN COMPUTER SCIENCE (1). Prerequisite, graduate major in computer science or permission of instructor. Seminar on teaching, oral presentations, and writing in computer science. Spring. Weiss, Brooks.

322 SEMINAR IN PROFESSIONAL PRACTICE (1). Prerequisite, satisfaction of M.S. in Computer Science program program requirement. The role and responsibilities of the computer scientist in a corporate environment, as an entrepreneur, and as a consultant. Professional ethics. (Alternate years) Brooks.

323 SEMINAR IN RESEARCH (1). Prerequisite, graduate major in computer science. The purposes, strategies, and techniques for conducting research in computer science and related disciplines. (On demand) Staff.

334 COMPUTERS AND SOCIETY (1). Prerequisite, graduate major in computer science. Seminar on social and economic effects of computers on such matters as privacy, employment, power shifts, rigidity, dehumanization, dependence, quality of life. (On demand) Staff.

390 RESEARCH SEMINAR IN COMPUTER SCIENCE (0-3). Prerequisite, permission of the instructor. Seminars in various topics offered by members of the faculty. Fall and spring. Staff.
SCHOOL OF DENTISTRY

JOHN W. STAMM, Dean

Professors
- Roland R. Arnold, Immunology, Host-Microbial Biology
- Ikramuddin Aulakh, Tissue Regeneration, Wound Healing
- Stephen C. Bayne, Biomaterials, Clinical Research
- James D. Beck, Oral Epidemiology
- Doug Besley, Special Care Geriatrics
- Greg Essick, Dental Research Center
- Harald Heymann, Operative Dentistry, Biomaterials
- Robert P. Kuyk, Orthodontics, Biomaterials/Biomechanics
- William Maxner, Neurobiology, Pain Perception and Modulation, Pain Management
- Kenneth N. May Jr., Operative Dentistry
- Frank T. McIver, Pediatric Dentistry
- Valerie Murrah, Oral Carcinogenesis, Salivary Gland Malignancies
- Steven Offenbacher, Inflammatory Mediators, Host Response, Periodontal, and Systemic Diseases
- William Robert Proffit, Orthodontics
- Theodore Roberson, Operative Dentistry
- Michael Roberts, Pediatric Dentistry, Dental Lasers
- Daniel A. Shugars, Health Services Research
- David M. Simpson, Periodontology
- John W. Stem, Oral Epidemiology
- Ronald P. Strauss, Medical Sociology and Health Promotion/Disease Prevention
- Edward J. Swift, Dental Materials
- Martin Trope, Endodontics
- J. F. Camilla Tulloch, Orthodontics
- Swin U. Tovurdeh, Hormonal Regulation of Bone and Calcium Metabolism
- Timothy Turvey, Consequences of Craniofacial and Maxillofacial Surgery
- Donald A. Tyndall, Oral and Maxillofacial Radiology
- William F. Vann Jr., Pediatric Dentistry
- Donald W. Warren, Craniofacial Development and Dysfunction
- Raymond P. White Jr., Oral Surgery Therapies
- Aldridge Wilder, Clinical and Laboratory Dental Materials Research
- Ray Williams, Periodontology
- J. Tim Wright, Mineralization and Development, Genetic Disorders
- Misuo Yamauchi, Collagen Biochemistry, Physiology and Metabolism of Bone
- John Zuniaga, Nerve Injury and Regeneration

Associate Professors
- Tanya Bailey, Orthodontics
- Daniel Caplain, Oral Epidemiology
- Lyndon Cooper, Bone Cell Physiology, Implantology
- Diane H. Dilley, Pediatric Dentistry
- David A. Felton, Prosthodontics, Dental Implants, and Clinical Trials
- Patrick Flood, Cellular Immunology, Immune Response and Regulation
- Mary George, Dental Ecology
- Albert D. Guzik, Prosthodontics
- Lorne G. Kozulik, Pediatric Dentistry and Orthodontics
- Mark Kutcher, Oral Medicine
- John Ludlow, Oral and Maxillofacial Radiology
- Sergei Makarov, Inflammation and Pain
- Sally Mauriello, Radiology, Geriatric Dentistry
- Douglas R. McArthur, Prosthodontics
- Glenn E. Minley, Prosthodontics
- John D. Morriarty, Dental Implants, Clinical Periodontology
- Lauren Patton, Oral Medicine
- Diane Shugars, HIV and AIDS Pathogenesis, Virus-Host Cell Interactions
- Ager Sigurdsson, Endodontics, Dental Trauma, Pain Mechanisms
- Gary D. Slade, Oral Epidemiology
- John Steurdevant, Operative Dentistry
- Jeffrey Thompson, Dental Materials
- Carrell-Ann Triman, Orthodontics
- E. Leland Webb, Prosthodontics
- Rebecca S. Wilder, Dental Hygiene
- David Zajac, Craniofacial Disorders
- Thomas Ziemiecki, Prosthodontics

Assistant Professors
- Anne P. Dodds, Pediatric Dentistry
- James M. George, Computer Technologies
- Linda Levin, Endodontics
- Andre Mol, Oral and Maxillofacial Radiology
- David Paquette, Periodontology
- Patrice Pereira
- Andre Ritter, Operative Dentistry
- Janet Southerland, Diabetics and Periodontal Disease
- John Tiffee
- Karen Twana
- Jennifer Webster-Cyriaque

Clinical Professor
- Richard A. Beene, Orthodontics

Clinical Associate Professors
- Carolyn Bentley, Oral Diagnosis
- Charles F. Brantley, Advanced General Dentistry
- Dennis G. Hillenbrand, Oral And Maxillofacial Surgery
- Laura Jansen, Dental Ecology
- Charlotte Peterson, Dental Hygiene Education
- Vickie P. Overman, Dental Hygiene
- Mary Pettieres, Endodontics
- Enrique Platin, Oral and Maxillofacial Radiology
- Amin Rahim, Periodontology

Clinical Assistant Professors
- George H. Blakey, Oral and Maxillofacial Surgery, Anesthesia
- Stacy Chichester, Dental Hygiene Education
- Jeffrey Jelic, Oral and Maxillofacial Surgery
- Anthony Molina, Prosthodontics
- Allen Samuelson, Dental Ecology

Research Professors
- James D. Bader, Health Services Research
- Ceib L. Phillips, Biostatistics, Clinical Trials

Research Associate Professor
- Ed Kelly, Diagnostic Sciences, Neurobiology Brain Imaging

Research Assistant Professors
- Catherine Champagne, Inflammation
- John Elter, Dental Ecology
Wojciech Gnesik, Periodontology
Susi Lief, Craniofacial Related Anomalies, Periodontal and Systemic Diseases
Rosemary McKaig, Dental Ecology
Phoebe Madianos, Periodontology

Professors Emeriti
James Bawden
Marvin Block
Kent W. Healey
Phillip Hirsch
Malcolm Johnston
F. Webb McCracken III
Roy Peach

Graduate instruction in the School of Dentistry is offered in endodontics, operative dentistry, oral biology, oral and maxillofacial radiology, orthodontics, pediatric dentistry, periodontics, prosthodontics, and dental hygiene education and is designed to prepare dentists and dental hygienists for teaching, research, or specialty practice. All dental graduate programs leading to the Master of Science degree require the successful completion of oral and/or written comprehensive examinations, a research project, and a thesis. Consideration has been given to the requirements as set forth by the Commission on Dental Accreditation of the American Dental Association and the respective specialty boards. The Oral Biology Program leads to a Ph.D. degree.

Graduates who possess an appropriate degree and who meet the requirements of the Graduate School are considered for admission. For some programs, scores on the Graduate Record Examination must be submitted for an applicant to be considered for admission.

Enrollment for study in dental specialty programs requires a minimum period of residency of three years. The curricula have been designed to permit maximum flexibility in preparation for practice, teaching, or research, as well as to meet the educational requirements of the Specialty Boards. The Dental Hygiene Education Program is two years long. The Oral Biology Ph.D. Program requires four or more years to complete.

In addition to the courses listed herein, an appreciable number of elective courses is offered. The degree requirements vary slightly with each program. Detailed curricula requirements may be obtained by visiting the School of Dentistry's website at www.dent.unc.edu.

Tuition and Fees
Semester tuition and fees for residents total $2,600. The summer rate is $350. Instruments, books, and laboratory fees are to be determined. Nonresident tuition and fees total $8,500 per semester and $1,100 for the summer term. Tuition and fees are due at the time of registration.

Student loans are available on the same basis as for undergraduates. For additional information, write Office of Admissions, The University of North Carolina at Chapel Hill, School of Dentistry.

Core and Multiuse Courses Offered to Graduate Students in Dentistry

201 (DENG) INTRODUCTION TO RESEARCH DESIGN (1). Introduction to scientific methodology, clinical epidemiology, oral biology and technology transfer, clinical trials, evaluation of scientific literature, experiments of nature, animal models for oral research, ethics in research, laboratory simulations and research models, and proposal writing. Fall, Wright.

202 (DENG) BIOSTATISTICS (2). Introduction of biostatistical concepts, sampling, descriptive statistics, hypothesis testing, comparison of means and proportions, 2 x 2 and t x r tables, correlation and simple regression, sample size and power, analysis of variance, factorial anova, multiple regression, and nonparametric tests. Spring, Phillips.

203 (DENG) APPLIED DENTAL RESEARCH METHODS (2). Prerequisites, DENG 201 and DENG 202, or equivalent. Evaluate research methods used in basic, clinical, laboratory, behavioral, and epidemiological research in oral health and encountered in the dental literature. Master's thesis protocols completed by class participants are the basis of most seminar discussions. Fall, Beck.

206 (ORAD) ADVANCED ORAL RADIOLOGY (2). Radiographic selection criteria, efficacy of dental radiographs, panoramic radiology, extrarctal techniques, radiation risks and radiological hygiene in dental practice, principles of radiologic interpretation, radiology of cysts and tumors, radiology of the TMJ, radiology of systemic disease, quality improvement, radiology for dental implants, digital imaging in dentistry, and advanced imaging of the craniofacial region. Spring, Tyndall.

207 (OMSU) REGIONAL ANATOMY (3). Review of the anatomy of the head and neck region, including osseous, cardiovascular system, head and neck embryology, special sensory modalities, nervous system, functional nervous system, and extrarctal correlation with the oral cavity. Summer, Montgomery.

210 (DENG) SCIENTIFIC COMPUTING (2). Use of microcomputers and introduction to word processing, biomedical literature searching, bibliographic management, presentation graphics, and exploring the Internet. Lecture and lab. Fall, George.

213 (ORTH) PRINCIPLES OF ORTHODONTIC TREATMENT FOR ADULTS (2). Topics include orthodontic evaluation, records, diagnosis and treatment planning, fixed vs. removable appliance for tooth movement, orthodontic extrusion, molar uprighting, periodontal implications of orthodontic treatment, biology of tooth movement, incisor alignment, and integrated treatment. Fall, Beane.

220 (OMSU) CLINICAL PHARMACOLOGY AND THERAPEUTICS (1). Covers compliance, substance abuse, antibiotic considerations, cardiology in dental practice, clinical pharmacology of relevant reactions and interactions of medications encountered in dental practice, dental prescribing and general considerations in pediatrics, pain management, and oral manifestations associated with selected medications. Summer.

233 (OBIO) DIRECTED STUDIES IN ORAL BIOLOGY (1, 1, 1). Introduces key concepts in oral biology, examines research methods used in oral biology research, and provides exposure to critical thinking. Summer, Arnold.

234abcd (OBIO) HOST ORAL PATHOGEN INTERACTIONS (2). Topics include extracellular matrices, immunology, inflammation, neurobiology, and pain management. Fall, spring, Yamauchi, Arnold, Maxner, Flood.

251 (OMSU) ADVANCED PAIN AND ANXIETY CONTROL (2). Introduction to operating room and recovery room protocol, patient cardiovascular and pulmonary evaluation, adjunct and inhalant agents, nitrous oxide, pharmacology of IV anesthetic agents, EKG interpretation, arterial blood gases, anesthesia equipment monitoring, anesthetic complications and emergencies, fluid and electrolyte and blood therapy, airway management, venipuncture, pediatric anesthesia, and pre-op evaluation, orders, and rounds. Spring, Roberts.

262 (ORPA) ORAL AND MAXILLOFACIAL PATHOLOGY SEMINAR (2). Fall topics include developmental disturbances of soft and hard tissues, syndromes, inflammation, immunology, pulpal and peripheral disease, periodontal disease, tumor-like proliferations, microbial disease, endocrine and metabolic diseases. Spring topics include odontogenic cysts, salivary gland disease, oral epithelial and mesenchymal neoplasms, bone and joint diseases, nerve and muscle diseases, dermatological diseases, and blood diseases. Fall, spring, Burkes.

263 (ORPA) ORAL AND MAXILLOFACIAL PATHOLOGY SEMINAR (2). Continuation of ORPA 262. Spring, Murrah.

301ab (DENG) INTERDISCIPLINARY CARE CONFERENCE I (1, 1). For first year dental graduate students. Review and discussion of the diagnoses, treatment plans, prognosis, and interdisciplinary care of selected patients. Fall, spring, Brantley, Levin.
The Faculty and Their Research

Oral Neurobiology: Greg Essick, somatosensory and motor research; Mark Hollins, somatosensory and motor research; Edward F. Kelly, neural mechanisms; Alan Light, neurobiological modulation of neural transmission; William Mainier, neurobiology, pain perception; Glenn Matsushima, neuroimmunology; Gerry S. Oxford, neural mechanisms; Aldo Rustioni, neurophysiology; Donald W. Warren, craniofacial development and dysfunction; John Zuniga, nerve injury and regeneration.

Pathogenesis: Roland R. Arnold, immunology, host-microbial biology, secretory immunity; Patrick M. Flood, cellular immunology, immune response and regulation; Reber E. Johnston, viral pathogenesis; Thomas Kawula, bacterial pathogenesis; Linda Levin, genetic expression in human odontoblasts, molecular characterization of the pulp immune response; Golan Matsushima, neuroimmunology; Steven Offerbacher, inflammatory mediators, host response, periodontal and systemic diseases; Nancy Raab-Traub, pathogenesis of Epstein-Barr virus; Diane C. Shugars, human immunodeficiency viruses and AIDS pathogenesis, virus-host cell interactions; Christina Teng, human lactoferrin structure and function; Jenny Ting, molecular immunology, neuroimmunology, gene regulation; Roland Tisch, immunology and diabetes; Jennifer Webster-Cyriaque, oral manifestations of systemic disease, host-virus interactions.

Biology of Extracellular Matrices: Ikramuddin Aukhil, tissue regeneration, wound healing; Steven Bachenheimer, host cell-virus interactions involving neurotropic herpes simplex virus; effects of HSV on cell cycle and signal transduction; Lynden Cooper, bone cell physiology, implantology; Miles Crenshaw, biomaterialization; Gayle Lester, bone physiology; Lola Reid, stem cell differentiation and extracellular matrix interactions; Kenneth Tollerud, application of mass spectrometry to protein characterization, determination of posttranslational modifications of proteins; Svein Toverud, hormonal regulation of bone and calcium metabolism; John Timothy Wright, mineralization and development, genetic disorders, extracellular matrices: Mitsuo Yamashita, collagen biochemistry, physiology and metabolism of bone.

Research Facilities

The Oral Biology Graduate Program is located in the Dental Research Center, the central base for much of the basic science research in the five-building School of Dentistry, with access to SEM/TEM microscopy, tissue culture facilities, anaerobic microbiology support, ALAC-accredited animal facilities, a P-3 level isolation facility; atomic absorption spectrophotometry, computers and software for image analysis/enhancement and finite element analyses, and a Clinical Research Unit including an eight-patient operatory. Biostatistical assistance is readily available as well as medical illustration, photography, radiology, and grants management.

Financial Aid

Graduate research assistantships are awarded competitively for students accepted for the Oral Biology Ph.D. Program. These assistantships provide support through program resources during the first two years at the rate of $14,000 annually, with health insurance, and may include a special tuition rate for out-of-state students. Support for dissertation research (beginning third year) is made available by faculty mentors.

Applying

Individuals with significant background in basic sciences and/or dentistry and medicine who are interested in developing research skills and focus and studying current issues in oral biology are encouraged to apply. Students
who wish to study for the Ph.D. degree receive preference. Research experience is an asset and a statement of research interests is desirable. Applications are accepted for admission to the fall session, and are preferred by January 31. Application requirements include GRE and TOEFL (for foreign applicants), documentation of previous scientific or medical studies, and transcripts for all undergraduate and graduate education. Candidates will be selected on a competitive basis by faculty of the Oral Biology Program serving on a selection committee. Candidates' research interests, research qualifications, and appropriate opportunities will be significant factors in selection.

Correspondence and Information

Cindy Blake, Graduate Program Coordinator
Oral Biology Ph.D. Program, School of Dentistry
101 Dental Research Center, CB# 7455
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-7455
Telephone (919) 966-1538
Fax (919) 966-3683
Refer also to www.dent.unc.edu

Graduate Courses in Oral Biology

203 (OBIO) MATERIALS FOR BIOLOGICAL APPLICATIONS (1).
Prerequisite: approval of the instructor. This course summarizes current knowledge of materials commonly used in biological applications. Emphasis is on their chemical, mechanical, and structural characteristics and the relationship between these factors and appropriate clinical applications. Taylor, faculty on staff.

204 (OBIO) CONGENITAL MALFORMATIONS OF THE OROFACIAL REGION (1).
Prerequisite: approval of the instructor. Students interested in the etiology, growth mechanism, and treatment of congenital defects and associated anomalies are acquainted with significant aspects of the deformities. Faculty on staff.

206 ab (OBIO) INTRODUCTORY ASPECTS OF PROTEIN CHEMISTRY (1).
Prerequisite: approval of the instructor. Consideration of selected aspects of protein chemistry with special attention given to problems associated with proteins found in hard tissues and saliva. One lecture hour a week. Fall and spring. Faculty on staff.

207 (OBIO) SEMINAR IN SPEECH PHYSIOLOGY (2).
Prerequisite: permission of the instructor. Evaluation of recent research in areas of anatomy, physiology, growth and development, genetics, and acoustics as they relate to the science of speech. One lecture hour a week. Fall and spring. Warren.

208 abcd (OBIO) DISCUSSION IN ORAL BIOLOGY (2).
Prerequisite: approval of the instructor. A series of seminars on topics relevant to research and scientific knowledge in the field of oral biology. Visiting scientists from other research centers in the country and abroad participate in the discussion series. One lecture hour a week. Fall and spring. Faculty on staff and visiting lecturers.

209 abcd (OBIO) RESEARCH TECHNIQUES IN ORAL BIOLOGY (6).
Prerequisite: approval of the instructor. The course familiarizes participants with a selection of specialized research techniques employed in interdisciplinary basic science approaches to problems in oral biology. Four lecture laboratory hours a week. Spring and summer. Faculty on staff.

210 ab (OBIO) RESEARCH (1-5 per semester).
Prerequisite: approval of staff. Students pursue the literature and select a research project in oral biology that is planned and conducted under direction of research staff. The project is intended to lead to a thesis to meet the requirements of a Master of Science degree. Fifteen hours of research a week. Summer, fall, and spring. Faculty on staff.

222 (OBIO) SEMINAR IN STRUCTURAL AND HARD-TISSUE PROTEINS (1).
Prerequisite: approval of the instructor. Students discuss significant developments pertaining to the chemistry of molecular biology of the structural proteins. The biochemistry of these proteins is correlated with their various functions. Criticals of current literature are emphasized. One lecture hour a week. Spring. Faculty on staff.

233 (OBIO) ADVANCED ORAL BIOLOGY (3, 2).
Prerequisite: None. Significant developments and trends in basic medical sciences that have applications in specialized dentistry are discussed. Recent publications taken from medical and dental scientific literature are discussed. Three hours a week. Summer. Arnold, faculty on staff.

234 abcd (OBIO) DIRECTED STUDIES IN ORAL BIOLOGY (2).
Topics include extra cellular matrices, immunochemistry, inflammation, neurobiology, and pain management. Fall. Spring. Arnold.

249 ab (OBIO) BIOLOGICAL CONCEPTS (3).
Overview of structures and biological determinants of conditions and diseases of the oral cavity; the human body, development and pathology of the oral cavity. This course will be introduced in the context of three areas of oral biology: biology of extracellular matrices, host-pathogen interactions, and orofacial neurobiology. Prerequisite: OBIO 250. Fall. Faculty on staff.

250 (OBIO) EXTRACELLULAR MATRICES (3).
Introduction to structures and biological functions of major extracellular matrix components, their interactions with cells, chemistry and biology of mineralized tissues, and biological and molecular aspects of connective tissue disorders. Lectures, discussions. Fall. Yamachii facultv on staff.

251 (OBIO) OROFACIAL NEUROBIOLOGY (3).
Overview of normal orofacial sensation and function, evaluation of orofacial sensory and motor capacities, orofacial pain mechanisms, and neural control of orofacial behavior. Lectures, literature review, discussions, seminars. Spring. Essick, faculty on staff.

252 (OBIO) HOST-PATHGEN INTERACTIONS (3).
Overview of basic etiology of pathogens and associated medical conditions, immune factors, immune response, and oral microbiology/immunology, with emphasis on infectious disease processes and innate defense factors. Lectures, discussions. Spring. Flood, faculty on staff.

280 ab (OBIO) THE MOLECULAR AND CELLULAR PATHOGENESIS OF INFLAMMATORY DISEASES (6).
Prerequisite: biochemistry and immunology, permission of instructor. Course presents recent information on the pathogenesis of inflammatory conditions from the molecular, cellular, and systems perspectives. The two-semester course covers molecular signals, cellular processes, pathogenesis of specific inflammatory conditions, and the immunopathology of inflammation. Lecture, seminar. Fall (a), spring (b). Oral Biology faculty. (Course director: Ofenbacher.)

393 ab (OBIO) MASTER'S THESIS (0-6).
Prerequisite, permission of staff. Faculty on staff.

394 ab (OBIO) DOCTORAL DISSERTATION (0-6).
Prerequisite, permission of staff. Faculty on staff.

Oral and Maxillofacial Surgery

The graduate curriculum in Oral and Maxillofacial Surgery consists of a study of the basic biological sciences and clinical experience integrated with a progressively graduated four-year sequence of approved hospital experience. This flexible program is designed to: (1) prepare dentists for a career in teaching, research, and/or practice in the specialty of oral and maxillofacial surgery; (2) meet the requirement for approval by the Commission on Dental Education of the American Dental Association; and (3) prepare candidates for certification by the American Board of Oral and Maxillofacial Surgery. While the study of the comprehensive biological sciences is integrated and stressed throughout the four years, the more formally structured courses are emphasized during the first two years of residency. More time is spent in seminars and independent study during the junior and senior residency years (third and fourth years). The latter allows flexibility for investigative
study and additional rotations through various hospital services, and for
additional elective assignments to provide more in-depth experience and
knowledge related to oral and maxillofacial surgery.

All students are required to complete the full four-year program including
the prescribed formal courses, seminars, independent study, and original
research project. One program option is to earn the degree of Master of
Science in Dentistry (Oral and Maxillofacial Surgery) by submission of a
thesis.

Other optional courses of study for selected individuals in this program
may include qualifying for an M.D. degree or a Ph.D. in a biological sci-
ence. This involves an extended period of time that is individualized for
each qualified student pursuing these additional studies.

Admission to the Graduate School for the study of oral and maxillofacial
surgery is accomplished only after the the appropriate committees review
the application, transcripts, and other credentials.

Graduate Courses in Oral and Maxillofacial Surgery

270 (OMSU) REGIONAL ANATOMY (2 or more). Lecture. Laboratory.
Montgomery.

212 abc (OMSU) ORAL AND MAXILLOFACIAL SURGERY-ADVANCED
ORAL AND MAXILLOFACIAL SURGERY (12). Faculty on staff (Dental School
and UNC Hospitals).

214 abc (OMSU) ORAL AND MAXILLOFACIAL SURGERY-GENERAL
ANESTHESIA (6). (UNC Hospitals) Faculty on staff.

215 abc (OMSU) ORAL AND MAXILLOFACIAL SURGERY-PHYSICAL
DIAGNOSIS (12). (UNC Hospitals) Faculty on staff.

230 (OMSU) ORAL AND MAXILLOFACIAL SURGERY-BASIC SURGICAL
SKILLS (4). (UNC Hospitals). This course includes an experimental animal sur-
gery laboratory portion as well as lectures and demonstrations of surgical principles
and techniques. Faculty on staff.

262 (ORPA) ORAL PATHOLOGY AND HISTOPATHOLOGY I (1). Fall.
Murrab.

263 (ORPA) ORAL PATHOLOGY AND HISTOPATHOLOGY II (2). Spring.
Murrab.

301 (OMSU) RESEARCH (6). To be arranged.

320 (DENT) INTRODUCTION TO DENTAL IMPLANTS (1). Lectures and
seminars on use of dental implants. Fall. Moriarty.

393 (OMSU) THESIS (3 or more).

Operative Dentistry

The Department of Operative Dentistry offers a three-year program leading
to an M.S. degree granted by the UNC Graduate School. The program
involves component areas of research, teaching, and patient care. The cur-
criculum includes (1) general core courses including topics in basic and clinical
sciences; (2) courses in educational sciences; (3) a research component
including courses on research design and statistical methods; and (4) a clin-
iclal component in contemporary operative dentistry. A formal thesis based
on a selected research topic will be required, including its defense before an
examining committee. The UNC Graduate School also requires a compre-
hensive written examination.

The admission policy for graduate training in operative dentistry follows
the regular requirements for admission to the Graduate School. Admission
to the Graduate School is granted only after the department reviews and
approves the application, transcript of prior academic work, letters of refer-
ence should be mailed to the Dental Admission Office, UNC-Chapel Hill
School of Dentistry, Chapel Hill, NC 27599. All application materials
should be submitted by December 1 for the following summer class.

Students begin the program July 1. The number of students is limited to
two each year.

Graduate Courses in Operative Dentistry

201a (OPER) OPERATIVE DENTISTRY SEMINAR I (1). An intensive review
of the basic principles of operative dentistry, pathology, and treatment planning
which provides a foundation for all other courses in operative dentistry. The core
text for this review is the Art and Science of Operative Dentistry.

201b (OPER) OPERATIVE DENTISTRY SEMINAR II (1). (Aesthetic and
Adhesive Dentistry) In this seminar, graduate students will learn the scientific prin-
ciples and clinical techniques involved in dental aesthetics and adhesive restora-
tions. Each student is required to develop a case presentation for this seminar.

201c (OPER) OPERATIVE DENTISTRY SEMINAR III (1). (Topics in
Operative Dentistry) A review of selected topics in operative dentistry, includ-
ing biomaterials, clinical research, and aesthetic dentistry.

203a (OPER) OPERATIVE DENTISTRY RESEARCH I (1). (Review of
Operative Literature) In this seminar, students will develop and write a
detailed description of materials and methods used in his or her research project.

203b (OPER) OPERATIVE DENTISTRY RESEARCH II (2). (Thesis Materials
and Methods) Student will perform research project and obtain data for the master’s
thesis.

204a (OPER) OPERATIVE CLINICAL SEMINAR A (1). This seminar will
involve a series of presentations where the student will present clinical cases resolved
in the graduate clinic.

204b (OPER) OPERATIVE CLINICAL SEMINAR B (1). Continuation of CI
Seminars 204A course involving a series of presentations where the student will pres-
ent clinical cases resolved in the graduate clinic.

290a (OPER) OPERATIVE DENTISTRY CLINIC I (1). Basic operative den-
tistry treatment planning and procedures.

290b (OPER) OPERATIVE DENTISTRY CLINIC II (4). Patient treatment.
Primary focus is on patients requiring more advanced considerations for operative
dentistry treatment planning and/or procedures. There will be a strong focus on aes-
thetic dentistry, prevention and "medical management" of cases, and the use of
advanced technologies to provide operative dentistry treatment.

290c (OPER) OPERATIVE DENTISTRY CLINIC III (4). Continuation of
Operative Dentistry Clinic II.

290d (OPER) OPERATIVE DENTISTRY CLINIC IV (3). Continuation of
Operative Dentistry Clinic III.

290e (OPER) OPERATIVE DENTISTRY CLINIC V (4). Continuation of
Operative Dentistry Clinic IV.

290f (OPER) OPERATIVE DENTISTRY CLINIC VI (4). Continuation of
Operative Dentistry Clinic V.

290g (OPER) OPERATIVE DENTISTRY CLINIC VII (3). Continuation of
Operative Dentistry Clinic VI.

393a (OPER) OPERATIVE DENTISTRY THESIS (3). The student will begin
writing a master’s thesis.

393b (OPER) OPERATIVE DENTISTRY THESIS (3). The student will finish
writing and defend the master’s thesis.
Oral and Maxillofacial Radiology

The Advanced Education Program in Oral and Maxillofacial Radiology begins in the fall semester and extends for three years, leading to a Master of Science degree. The purpose of the program is to prepare qualified oral and maxillofacial radiology specialists to function in institutions of higher dental education, research, and clinical practice. The program prepares individuals to participate in maxillofacial radiological practice, provides background information on radiation physics, radiation biology, and protection, and offers research training preparation. Each student participates in an extensive research project for the thesis and several smaller department-based projects.

Each graduate student and his or her faculty adviser develops an original clinical or applied research project that is an integral part of the graduate program. A written thesis is required. The program meets the eligibility requirements of the American Dental Association for certification as an Oral and Maxillofacial Radiologist.

Applications should be submitted by May 1. Interviews are usually scheduled before final acceptance.

Graduate Courses in Oral Radiology

162 (RAD) RADIOGRAPHIC IMAGING (4). Fall, Burns.

185 (RAD) RADIOLOGICAL HEALTH PHYSICS (3). Spring, Plotz.

202 (ORAD) ADVANCED ORAL RADIOLOGIC TECHNOLOGY (4).
Seminars, laboratory, and clinical sessions to provide experience in advanced oral radiologic procedures. Spring, Platin.

203 (ORAD) ADVANCED ORAL RADIOGRAPHIC DIAGNOSIS I (3).
Literature review and seminars to present advanced radiologic diagnosis. Fall, Tyndall.

204 (ORAD) ADVANCED RADIOLOGIC DIAGNOSIS II (3).
Literature review, seminars, and clinical experience in advanced radiologic diagnosis. Summer, Ludlow.

205 (ORAD) PRINCIPLES FOR ADVANCED DIAGNOSTIC AND THERAPEUTIC RADIOLOGY (4).
Literature review and seminars in the application of radiologic procedures such as computed tomography, digital imaging, and magnetic resonance for diagnosis of oral and maxillofacial conditions. Fundamentals of radiation therapy are also included. Tyndall.

206 (ORAD) ADVANCED ORAL RADIOLOGY (2).
Lecture and seminars in advanced radiology topics. Spring, Tyndall.

207 abcdef (ORAD) GRADUATE CLINICAL ORAL RADIOLOGY (3, 3, 3, 3, 3, 3). Fall, spring, summer (first year); summer, fall, spring (second year). Tyndall.

226 (ORAD) SPECIAL PROJECTS IN ORAL AND MAXILLOFACIAL RADIOLOGY (3).
In this course students will conduct research in the area of Oral and Maxillofacial Radiology utilizing clinical or laboratory methods in collaboration with course faculty. Tyndall.

302 abcd (ORAD) CLINICAL RADIOLOGY CONFERENCE (1-4).
Case studies in the interpretation of unusual conditions of the oral and maxillofacial region. Fall, spring, summer (first year); summer, fall, spring (second year). Tyndall.

360 (ORAD) ORAL RADIOLOGY RESEARCH (1-4).
Arranged. Faculty on staff.

393 (ORAD) MASTER'S THESIS (3).

Core Courses Required

207 (ANAT) REGIONAL ANATOMY (3). Summer, Montgomery.

262 (ORPA) HISTOLOGY AND HISTOPATHOLOGY (2). Fall, Burkes.

263 (ORPA) HISTOLOGY AND HISTOPATHOLOGY (2). Spring, Burkes.

(DENG) SCI COMPUTING/LAB (2). Fall, George.

(DENG) RESEARCH METHODS (1). Fall, Wright.

(DENG) BIOSTATISTICS (2). Spring, Phillips.

203 (DENG) APPLIED RESEARCH METHODS (2). Fall, Beck.

Orthodontics

Admission for graduate study in orthodontics is made only after the department faculty and the Graduate School review and approve a completed application. Application for entry into the program in August should be made by October 1 of the previous year. Interviews are scheduled in November. Admission decisions normally are made late in November.

The three-year curriculum in orthodontics is designed to prepare dentists for clinical practice in the specialty of orthodontics and meets the educational requirements for oral specialty board certification. All students participate in research in the department and are expected to earn the Master of Science degree by completion of a thesis project.

During the program's first year, students participate in seminars selected from the principal didactic courses, discuss clinical topics in seminars, and begin patient care. As the program progresses, didactic seminars gradually are replaced by research participation while clinical seminars continue and the volume of patient care increases. All students must perform satisfactorily on oral and written comprehensive examinations to complete the program successfully.

Graduate Courses in Orthodontics

201 (ORTH) ORTHODONTIC TECHNIQUE (4).
Introduction to orthodontic technique and procedures for beginning orthodontic graduate students. Fall, first year. Profitt, faculty on staff.

203 ab (ORTH) ORTHODONTIC DIAGNOSIS (2, 2).
Principles of orthodontic diagnosis and analysis of diagnostic records for orthodontic specialists. Fall, spring. Tulloch, faculty on staff.

204 (ORTH) INTRODUCTION TO CLINICAL ORTHODONTICS (2).
Principles of clinical patient care for specialty practice in orthodontics. Fall, Bailey, faculty on staff.

205 abcd (ORTH) ADVANCED CLINICAL ORTHODONTICS (5, 3, 7, 7, 3).
Fall, spring, summer. Bailey, faculty on staff.

206 (ORTH) BIOMECHANICS (2).
Mechanical principles in orthodontic force production and control; biological response to orthodontic force. Fall, Kusy. Profitt.

206 (ORAD) ADVANCED ORAL RADIOLOGY (2).
Acquaints graduate students with the radiographic techniques and equipment currently available to the profession. Includes a review of appropriate radiographic anatomy. Spring, Tyndall.

207 (ORTH) ORTHODONTIC BIOMATERIALS (1-3).
Introduction to orthodontic biomaterials and integration with the basic principles of engineering, science, and orthodontics. Spring, Kusy.

208 (ORTH) GROWTH AND DEVELOPMENT (4).
Principles of growth and development, emphasizing dentofacial development from an evolutionary and molecular biology perspective as well as the traditional anatomical perspective. Spring, Tulloch, faculty on staff.

210 (ORTH) CRANIOFACIAL ANOMALIES (2).
The clinical management of craniofacial anomalies, including cleft lip and palate, and the associated interdisciplinary approach to treatment planning. Fall, Trottman.

213 (ORTH) PRINCIPLES OF ORTHODONTIC TREATMENT FOR ADULTS (3).
Orthodontic treatment procedures for adults; for AEGD, periodontics, and prosthodontic graduate students. Fall, Beane.
215 (ORTH) ORAL-PHARYNGEAL FUNCTION (1). Maturation of oral and pharyngeal function, including speech and its relation to dento-facial development. Fall. Prof. Prof. R.

220 (ORTH) ADVANCED BIOMECHANICS (2). Concepts in orthodontic mechanics emphasizing segmented arch approaches and laboratory tests of appliance components and designs. Summer. Prof. R. Kisby.

222 (ORTH) ENVIRONMENT OF SPECIALTY PRACTICE (3). Trends in health care delivery; organization and management of orthodontic specialty practice. Fall. Beane, faculty on staff.

301 abcd (ORTH) RESEARCH (2, 1, 2, 3, 3). Arranged. Prof. R. Phillips.

302 ab (ORTH) CURRENT TOPICS IN ORTHODONTICS (2, 2). Seminars on pertinent orthodontic literature for advanced orthodontic students. Fall, spring. Prof. Prof. R.

393 (ORTH) THESIS (3 or more).

Pediatric Dentistry

The Advanced Education Program in Pediatric Dentistry requires participation in both the centralized application and matching services. Application requires submission of the required transcripts and documentation to the Postdoctoral Application Support Service (PASS), 1625 Massachusetts Avenue, N.W., Suite 101, Washington, DC 20036. All candidates must register with the Postgraduate Dental Matching Program, 595 Bay Street, Suite 300, Toronto, Ontario, Canada M5G 2C2. A personal interview is required and interviews are made by invitation of the department after reviewing applicants' records. All candidates must complete an application to the Graduate School once they have been selected for an interview.

The department offers a graduate program in Pediatric Dentistry leading to a M.S., M.D. or Ph.D. degree. The minimum program length is thirty-six months, beginning July 1. The program's goal is to prepare the student for a career in academic research, dental education clinical practice, or public health. Developing leadership skills and training advocates for children's health is emphasized. For interested students, this program can be combined with other educational programs in the social sciences, basic sciences, or allied health professions leading to an additional master's degree, postdoctoral fellowship, an individual Dentist-Scientist award, or a doctoral degree.

During the first year each student completes courses in research design and statistics. A protocol for the research project is completed in conjunction with the course work during the first year. This project provides a background in the scientific method and scientific writing. During the second year data are collected and during the third year the thesis is written and defended. Under the direction of leaders in many fields of research, research opportunities are available in a wide range of topics and can be undertaken in the School of Dentistry, the Dental Research Center, Research Triangle Park, or neighboring institutions. Numerous projects have received national acclaim and have resulted in publications in dental literature. Hospital training is gained through the University of North Carolina Hospitals. Graduate students are active members of the department's teaching team during all years. Development of leadership skills in the health profession is supported by externship at the local, state, and national levels.

Stipends are available depending upon available resources.

Graduate Courses in Pediatric Dentistry

200 abcd MATERNAL AND CHILD HEALTH SEMINAR SERIES (1, 1, 1, 1). (One hour/week for each fall and spring semester.) This is a seminar series that focuses on a broad range of topics related to pediatric dentistry and pediatric medicine including general medical issues, practice management, social issues, child advocacy, and presentation of unusual clinical cases. Roberts.

201 abedef PEDIATRIC DIAGNOSIS AND TREATMENT PLANNING SEMINAR (1, 1, 1, 1, 1, 1). (One hour/week each fall and spring semester for two years.) This course is a seminar wherein diagnosis and treatment planning options are considered through a problem-oriented approach. For cases in progress and completed, outcomes are reviewed and critiqued. Vann.

203 PRINCIPLES OF PEDIATRIC DENTISTRY (Six hours/month for fall and spring semesters for twenty-four months.) This seminar covers the fundamentals of pediatric dentistry from behavior management to pulp therapy. The course relies on readings of classic and contemporary literature in seminars that include discussions and critiques of readings. Vann and Pediatric Dentistry faculty.

204 ADVANCED CLINICAL PEDIATRIC DENTISTRY (Six to twelve hours/week for thirty-six months.) This course provides clinical experience in all phases of pediatric dentistry, including dental treatment under conscious sedation and general anesthesia. Faculty on staff.

205 CONTEMPORARY PRACTICE MANAGEMENT (One hour monthly during the spring semester for three years.) This course provides an understanding of design, implementation, and management of a modern pediatric dental practice. Most seminar leaders are private practitioners who are adjunct faculty in the department. Vann.

206 TREATMENT OF PEDIATRIC DENTAL EMERGENCIES (One hour/week each week for thirty-six months.) This seminar series serves as a faculty/resident forum for reviewing the previous week's emergency cases in which diagnosis and treatment options are reviewed and critiqued. Endodontic faculty/residents also participate in this course. Vann.

209 PREVENTIVE ORTHODONTICS (Seven hours/week each semester for thirty-six months.) This course provides an opportunity for students to learn and demonstrate a thorough orthodontic diagnosis and establish realistic treatment objectives considering all aspects of the patient's treatment needs. This course also provides clinical experience in treating limited orthodontic problems seen commonly by pediatric dentists. Koroluk.

301 RESEARCH (Minimum of one half-day/week for thirty-six months.) Students pursue an institutionally approved research project under the guidance of the faculty following review of the pertinent literature and planning on the basis of sound experimental design. Faculty on staff.

393 MASTER'S THESIS. Faculty on staff.

Periodontology

The Graduate Program in Periodontology is designed to prepare dentists to enter the clinical practice of periodontics or to assume positions in academics and research. Stipends are provided during the three years of study.

The program consists of a thirty-six-month course of study leading to a certificate in Periodontics and a Master of Science degree. Alternative degree programs include a Master of Public Health or a Ph.D. in Oral Biology. The first two years are devoted primarily to the study of biological concepts and literature that relate to periodontology, as well as to the acquisition of clinical skills in diagnosing and treating diseases affecting tooth-supporting tissues. A portion of the first two years is devoted to research. The third year involves a combination of patient care, teaching, research, and the successful completion of a thesis. Elective courses relating to areas of research interests are available.

The admission policy for graduate training in periodontology follows the regular requirements for admission to the Graduate School. Admission to the Graduate School is granted only after the departmental reviews and approves the application, transcript of prior academic work, letters of reference, and other credentials. All applications, transcripts, and letters of reference should be mailed to PASS, 1625 Massachusetts Avenue, N.W., Suite 101, Washington, D.C. 20036. All application materials should be submit-
ted by September 15 for the following summer class beginning July 1. A personal interview is required for admission.

Students begin the program July 1. The number of students is limited to three each year.

Graduate Courses in Periodontology

250 abc (PERI) ADVANCED CLINICAL PERIODONTICS AND CLINICAL PRACTICE (9). Within this first year specialty clinic, graduate students begin diagnosing and comprehensively treating patients with periodontal diseases. Cases may involve interdisciplinary care, medical management, dental implants, and sedation procedures. Fall, spring. Department faculty.

251 abc (PERI) ADVANCED CLINICAL PERIODONTICS AND CLINICAL PRACTICE (9). Within this second and third year specialty clinic, graduate students gain proficiency in managing patients with periodontal diseases using both surgical and nonsurgical approaches. Again, cases may involve interdisciplinary care, medical management, dental implants, and sedation procedures. Fall, spring. Department faculty.

266 abc (PERI) PERIODONTAL THERAPY (1, 1, 1). This graduate seminar reviews techniques and procedures for treating periodontal diseases. Topics include gingival grafting, surgical flap management, osseous surgery, periodontal regeneration, antimicrobials, host modulation and periodontal medicine. Fall, spring. Madians.

268 abcd (PERI) CASE ANALYSIS (10). Course participants present comprehensive cases with periodontal conditions. Discussion focuses on periodontal diagnosis, treatment planning, treatment execution and results. Fall, spring. Paquette.

270 ab (PERI) SEMINAR IN PERIODONTOLOGY (6). In this first year literature review course, graduate students present and evaluate the evidence on periodontal disease etiology, pathogenesis, risk factors and treatments including mechanical, surgical and pharmacological approaches. Fall, spring. Simpson, Paquette.

271 ab (PERI) SEMINAR IN PERIODONTOLOGY (6). In this second and third year literature review course, graduate students discuss evidence on advanced topics in periodontology or related disciplines. Fall, spring. Williams.

301 abcd (PERI) RESEARCH (5 each). Fall, spring, summer. Department faculty.

320 (PERI) INTRODUCTION TO IMPLANTS (1). This graduate seminar traces the biology of osseointegration, surgical techniques in dental implant placement and prosthetic restoration. The seminar includes didactic lectures, case presentations and journal club components. Fall. Moriarty.

321 (PERI) CLINICAL IMPLANTOLOGY (1). This graduate seminar continues themes introduced in PERI 320 and discusses advanced implant topics including bone augmentation, peri-implantitis and implant efficacy assessment. The seminar includes didactic lectures, case presentations and journal club components. Spring. Moriarty.

393 (PERI) THESIS (3 or more).

Prosthodontics

The admission policy for graduate training in Prosthodontics follows the regular requirements for admission to the Graduate School. Admission to the Graduate School is granted only after the application, transcript of prior academic work, letters of reference, and other credentials are reviewed and approved by the appropriate committee. All applications, transcripts, and letters of reference should be mailed to PASS, 1625 Massachusetts Avenue, N.W., Suite 101, Washington, D.C. 20036. All application materials should be submitted by September 15 for the following summer class beginning July 1. A personal interview is required for admission.

The Graduate Program in Prosthodontics is currently a thirty-six month course of study in fixed and removable prosthodontics, dental implant prosthodontics, and maxillofacial prosthodontics leading to a Master of Science degree. The primary goals of the program are to prepare a student for clinical practice and/or a teaching and research career. The curriculum offers a broad educational experience in clinical, research, didactic, and teaching activities. The program satisfies the formal training requirements of the American Board of Prosthodontics for certification examination in prosthodontics.

Stipends are available at various levels throughout the entire course.

Graduate Courses in Prosthodontics

230 abc (PROS) INTRODUCTION TO PROSTHODONTIC LITERATURE (2, 2, 2). A seminar designed to review early and classic prosthodontic literature common to fixed and removable prosthodontics. Summer (first year); fall, spring (third year). Director, faculty on staff.

231 abdef (PROS) PROSTHODONTIC PRINCIPLES, DIAGNOSIS, AND TREATMENT PLANNING-FIXED AND REMOVABLE (2, 2, 2, 2, 2). Principles of diagnosis and treatment relative to the prosthodontic patient are covered in depth in this seminar series. Fall, spring (first year); summer, fall, spring (second year); summer, spring (third year). Director, faculty on staff.

232 abdefghi (PROS) ADVANCED CLINICAL FIXED AND REMOVABLE PROSTHODONTICS (1, 3, 3, 3, 5, 5, 5, 3, 3). This clinical offering is designed to permit the graduate student to experience all phases of advanced patient management in fixed and removable prosthodontics. Summer, fall, spring (first year); summer, fall, spring (second year); summer, fall, spring (third year). Director, faculty on staff.

233 abcd (PROS) MAXILLOFACIAL PROSTHODONTIC PRINCIPLES, DIAGNOSIS, AND TREATMENT (1, 1, 1, 1). Principles of diagnosis and treatment relative to maxillofacial prosthodontic patients are covered in depth in this seminar series. Summer, fall, spring (second year); summer, spring (third year). Minskey, faculty on staff.

234 abdef (PROS) CLINICAL MAXILLOFACIAL PROSTHODONTICS (2, 2, 2, 2, 2, 2). This clinical offering is designed to permit the graduate student to manage the comprehensive prosthodontic care of congenital and/or acquired maxillofacial defects in both the dental school and hospital environment. Spring (first year); summer, fall, spring (second year); summer, fall, spring (third year). Minskey, faculty on staff.

235 abdefghi (PROS) RESEARCH (2, 3, 3, 3, 5, 5, 5). The graduate pursues the literature and selects a research project planned and conducted under the direction of the appropriate graduate faculty. Spring (first year); summer, fall, spring (second year); summer, fall, spring (third year). Graduate faculty.

236ab (OPER) GRADUATE DENTAL MATERIALS (3). This is a foundation course for dental materials science and dental materials applications. Fall, spring, Bayne.

393 (PROS) MASTER THESIS (3 or more). Completion of thesis for Master of Science degree. Spring (third year). Graduate faculty.

In addition to the courses listed, core courses are required in anatomy, microbiology, pharmacology, oral pathology, research methodology, scientific writing, and dental education. Flexibility in the curriculum also allows opportunity for appropriate electives.

Graduate Elective Courses

A number of graduate courses from allied clinical and biomedical disciplines are available as electives for prosthodontic graduate students. Though not required, elective courses are encouraged. Interest in electives (from within or outside the School of Dentistry) should be discussed with the program director so that the core curriculum can be adjusted to accommodate the student's needs.
Endodontics

The Department of Endodontics offers a three-year program leading to a certificate in endodontics and a Master of Science degree. The program is designed to prepare candidates for careers in academics, research, or the clinical practice of endodontics and for certification by the American Board of Endodontics.

The Endodontics Graduate Program involves an integrated study of biological sciences as they pertain to endodontics; development of the clinical skills required in the broad area of the endodontic specialty; review of classic and current literature in endodontics; teaching experience; research design and methodology; and development and completion of a research project. Enrollment is limited to two candidates each year. The course of study begins July 1.

Graduate Courses in Endodontics

210 abcde (ENDO) ADVANCED CLINICAL ENDOdontics (29). 870 hours of clinical practice. Faculty on staff.

211 abcde (ENDO) ENDodontics Seminar and CASE AnalYsis (15). 180 hours conference. Faculty on staff.

212 abcde (ENDO) ENDodontics Literature Review Seminar (20). 270 hours. Faculty on staff.

215 abcde (ENDO) ENDodontics Current Literature REVIEW (5). Seminar. Faculty on staff.

220 abcde (ENDO) Research (15). 675 hours of laboratory. Faculty on staff. Required each semester.

393 Thesis (3 or more). Third year.

Core Courses Required of Graduate Students in Dental Hygiene Education

115 (DHED) Current Concepts in CLINICAL SKILLS (2). This course will review and update students in current treatment and diagnostic modalities in dental hygiene education. Summer. Wilder.


136 (DHED) CLINICAL/LABORATORY TEACHING PRACTICUM (2). Fall. Peterson.

160A (DHED) Seminar in Education and Research (1). Fall. Wilder.

160B (DHED) Seminar in Education and Research (1). Fall. Wilder.


393 (DHED) Thesis (3). Fall. spring. Wilder.

201 (DENG) Research Design (1). Fall. Wright.


210 (DENG) Scientific Computing (2). Fall. George.

Elective (3).

Additional courses are required for each minor as follows:

Biological Sciences


104 (DENT) Microscopic Anatomy (4). Hadley.

114 (DENT) Physiology (4). Moss.

Clinical Education

153 (DHED) Advanced Intraoral Functions (3). Wilder.

154 (DHED) Advanced Intraoral Functions (Periodontics) (3). Wilder.

236 (DHED) Advanced/CLINICAL TEACHING (3). George.

Dental Radiology

190 (ORAD) Comprehensive Radiation Biology (1-2 variable).

M.F.A. programs are challenged to develop the skills and attitudes that enable them to compete in the professional theatre. Emphasizing accomplishment in a wide range of performance and production styles, the programs complement the variety of theatrical experiences available in the PlayMakers Repertory Company (PRC), a professional full-season Equity Company and a member of The League of Resident Theatres. Within his or her area of specialization, upon graduation students will be ready to perform a variety of roles or assume a range of responsibilities on or backstage in stage, film, or television.

Prerequisites. All applicants must meet admission requirements established by the Graduate School of The University of North Carolina at Chapel Hill. Each area of specialization within the department requires additional application materials. In the costume and technical areas, applicants are required to submit portfolios. Candidates should check with the department for further information as to what is required for each area. All acting candidates must audition. In addition to on-campus auditions, the department holds auditions two out of every three years in February in New York and Chicago. Applications must be received by January 31 to be considered.

Curriculum. Each candidate pursues a course of study in a conservatory environment. Classroom training offers a variety of approaches, each designed to develop and refine the candidate's artistic and professional potential. Classroom work is augmented by participation in the professional season of PlayMakers Repertory Company. In addition to the PRC, students find performance opportunities in studio projects and productions.

Evaluation. At least once each semester, the faculty formally evaluates the candidate's progress and makes recommendations concerning his or her continuation in the program. Evaluations are made of each individual on the basis of classroom and performance or production work. Letter grades (H, F, L, P) are assigned for work in all courses.

Admission. Generally, only first-year applicants are considered for admission. Candidates should check with the department for admission information pertaining to their specific area of specialization, i.e., acting, technical production, or costume production.

Residency and Requirements. All candidates are required to be in residence for three years, six consecutive semesters. The departmental system of evaluation requires that the student be invited to continue in the second and then in the final year of the program. While all programs require their students to complete sixty credit hours, those hours are apportioned differently from program to program. In addition to sixty credit hours, each area of specialization carries its own graduation requirements. Candidates are encouraged to ascertain individual requirements for graduation as soon as possible.

Detailed information can be obtained by addressing inquiries to: Director of Graduate Studies, Department of Dramatic Art, CB# 3230, Center for Dramatic Art, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3230. Additional information is available on the web at www.unc.edu/depts/playmkr.

Courses for Graduates and Advanced Undergraduates

100 TECHNICAL DIRECTION (3-6). Prerequisites, permission of instructor, Dramatic Art 64, Technical Methods, Technical Production section, or equivalent technical practice in theatre production. Study of the technical and engineering problems in production and standard theatrical drafting and construction conventions. Must be taken fall and spring. Genodchio, Rulleri, staff.

101 STAGE MANAGEMENT (3). A study of basic principles and practices of modern stage management. Fall and spring. Staff.

155 PLAYWRITING (3). Permission of the department required. A practical course in writing with stage productions of selected works. May be repeated once for credit. (B.A. perspective credit.) Spring. Mitchell.

157 PLAYWRITING (3). Prerequisite, at least one semester of Dramatic Art 155. A practical course in writing of the stage play. Alternate years. Staff.

165 SOUND DESIGN (3). The study of general principles of sound design for the theatre. Theory and application of sound design techniques for the stage, including script analysis, staging concepts, special effects, sound plots, and technology. Spring. Genochio.

166 SCENE DESIGN (3). Prerequisite, permission of the instructor. General principles of visual design as applied to scenery for the theatre. Instruction in standard techniques of planning and rendering scene design. (B.A. perspective credit.) Fall. Coble.

167 COSTUME DESIGN I (3). Prerequisite, permission of the instructor. Studies and practical in play analysis and costume design for the theatre. Instruction in techniques of planning and rendering costume design. (B.A. perspective credit.) Fall and spring. Holt, Owen.

168 LIGHTING DESIGN (3). Prerequisite, Dramatic Art 100 or equivalent training in drafting. General principles of lighting design as applied to the performing arts. Theory and instruction in standard techniques of lighting for the stage. Spring. Genochio.

169 COSTUME DESIGN II (3). Prerequisite, Dramatic Art 167 or permission of the instructor. Practicum in costume design for the theatre focusing on the requirements of professional theatre production and alternative costume design solutions. Spring. (Alternate year.) Holt, Owen.

170 SURVEY OF COSTUME HISTORY (3). A survey of significant costume forms from ancient Egypt to the present time. (B.A. Western Historical perspective credit.) Fall. Owen.

171 NON-WESTERN COSTUME HISTORY (3). The traditional costume forms on the African Continent, in Asia (China, Japan, India), and on the Arabian Peninsula explored through discussion of the historical and cultural forces and visual records. Spring. Owen.

172 SPECIAL TOPICS IN COSTUMING (Var. 1-3). Prerequisite, permission of instructor. Advanced study of historical pattern, costume crafts, or costume shop management through directed study. Fall and spring. May be repeated for credit. Adamson.

173 COSTUME CONSTRUCTION I (Var. 1-3). Prerequisite, permission of the instructor required. Beginning instruction in pattern making through flat pattern for theatrical costume. Fall. Adamson.

174 COSTUME CONSTRUCTION II (Var. 1-3). Prerequisite, Dramatic Art 173 or permission of the instructor. Beginning instruction on the dress form for theatrical costume. Spring. Adamson.

175 PERIOD STYLES FOR THE THEATRE (3). A study of visual, cultural, and social styles through history as the forms developed, and as they relate to stylactic production for the theatre. (B.A. Historical perspective credit.) Fall, spring. Coble.

176 ADVANCED SCENE DESIGN (3). Prerequisite, Dramatic Art 166 or permission of instructor. Advanced study of the principles and practice of designing scenery for the theatre. Fall. (Alternate year.) Coble. (B.A. Aesthetic perspective credit.)

185 PERIOD STYLES FOR PRODUCTION (3). A study of the historical development of Western minor arts and the ramifications of reproducing them for the theatre. Spring. (Alternate years.) Coble. (Western Historical Perspective credit.)

190 THEATRE MANAGEMENT (3). Prerequisite, permission of the instructor. A historical survey of theatre management in America with emphasis on commercial and not-for-profit theatres. Emphasis on theatre personnel, artistic concerns, financing, publicity, and marketing. Students actively engage in management areas of PlayMakers Repertory Company. Fall and spring. Staff.

191 ISSUES IN ARTS MANAGEMENT (3). Arts management issues taught through analysis of case studies. Course includes management theories, organizational structures, and current issues. (Alternate years.) Staff.

192 SPECIAL STUDIES (5-3). Open only to majors in the Department of Dramatic Art. Permission of the instructor required. Credit for performance and/or production experience in Department of Dramatic Art productions, including PlayMakers Repertory Company. A minimum of fifteen hours per week is required during the rehearsal period; a faculty evaluation is also required at the close of the production. Permission of the undergraduate adviser required. May be repeated for credit. Fall and spring. Staff.

193 SPECIAL STUDIES: TECHNICAL PRODUCTION (5-12). Prerequisite, permission of instructor and Dramatic Art 64, Technical Methods, Technical Production section. Advanced scenic construction techniques leading to specific project or production responsibility in the area of scenic construction in Department of Dramatic Art productions and PlayMakers Repertory Company. A minimum of fifteen hours per week is required during the rehearsal period. Faculty evaluation at the close of the production. May be repeated for credit. Fall, spring. Rolleli.

194 PROFESSIONAL THEATRE LABORATORY (5-12). Prerequisite, permission of department chair. Individual programs or internships in acting, directing, design, management, and playwriting under the guidance of professional practitioners in conjunction with the PlayMakers Repertory Company or of other approved professional theatre organizations. Locally supervised. Open only to advanced students. (Offered as required.) Staff.

196 SPECIAL STUDIES: COSTUME PRODUCTION (5-3). Prerequisite, permission of instructor and Dramatic Art 64, Technical Methods, Costume section. Advanced construction techniques in theatrical costuming. May be repeated for credit. Fall, spring. J. Adamson.

198 SEMINARS IN COSTUME PRACTICES (1-3). Prerequisite, Dramatic Art 64, Technical Methods, Costume section, and permission of instructor. Series of topics in costume for use in design and production for the stage. May be repeated for credit for 12 hours for graduate students, 6 for undergraduates. Taught in a four semester rotation. Fall, spring. Holt.

Courses for Graduates

200 SEMINAR IN PROFESSIONAL PRACTICE: TECHNICAL PRODUCTION (1-12). Prerequisite, admission to the M.F.A. program in Technical Production. An examination of professional theatre practice through contact with students, staff, faculty, and visiting artists in technical theatre. Generally taken fall and spring. May be repeated for credit. Genochio, Rolleri.

220 ACTING I (3). Prerequisite, admission to the M.F.A. Acting program. Intensive professional training for the actor. Must be taken fall and spring. Hammond.

221 ACTING II (3). Prerequisite, admission to the second year of the M.F.A. Acting program. Advanced professional training for the actor. Must be taken fall and spring. Dooley, Hammond.

222 VOICE I (3). Prerequisite, admission to the M.F.A. Acting program. Development of the individual actor’s voice and speech. Must be taken fall and spring. Raphael.

223 VOICE II (3). Prerequisite, admission to second year of the M.F.A. Acting program. Expansion of the individual’s vocal versatility in performance. Must be taken fall and spring. Raphael.

224 MOVEMENT I (3). Prerequisite, admission to the M.F.A. Acting program. Development of the actor’s body as an expressive instrument. Must be taken fall and spring. Turner.

225 MOVEMENT II (3). Prerequisite, admission to the second year of the M.F.A. Acting program. Advanced projects in movement. Special sessions in tumbling and stage combat. Must be taken fall and spring. Turner.
226 REHEARSAL AND PERFORMANCE I (1-6). Prerequisite, admission to the M.F.A. Acting program. Rehearsal and performance of special ensemble projects. Must be taken fall and spring. May be repeated for credit. Hammond, Dooley, Raphael, Turner.

227 REHEARSAL AND PERFORMANCE II (1-6). Prerequisite, admission to the second year of the M.F.A. Acting program. Practical application of techniques in rehearsal and performance in studio and main stage production. Must be taken fall and spring. May be repeated for credit. Hammond, Dooley, Raphael, Turner.

228 ACTING PRACTICUM I (6-12). Prerequisite, admission into the third year of the M.F.A. Acting program. Intense practicum as a member of the PlayMakers Repertory company. Preparation and presentation of assigned projects and work in departmental productions. Work in voice and movement as scheduled. Fall. Hammond, Dooley, Raphael, Turner.

229 ACTING PRACTICUM II (6-12). Prerequisite, admission into the third year of the M.F.A. Acting program. Intense practicum as a member of the PlayMakers Repertory company. Preparation and presentation of assigned projects and work in departmental productions. Work in voice and movement as scheduled. Spring. Hammond, Dooley, Raphael, Turner.

231 SEMINAR IN DRAMATIC LITERATURE (1-3). Prerequisite, admission to the M.F.A. program in any area. An examination of the literature of the theatre in terms of dramatic construction, theory, and interpretation. Must be taken fall and spring. May be repeated for credit. Barranger.

240 COSTUME LABORATORY I (3). Prerequisite, admission to the M.F.A. Costume program. Practical work in the costume shop. Must be taken fall and spring. Adamson.

241 COSTUME LABORATORY II (3). Prerequisite, admission to the second year of the M.F.A. Costume program. Advanced practical work in the costume shop. Must be taken fall and spring. Adamson.

242 COSTUME CONSTRUCTION III (1-3). Prerequisite, Dramatic Art 173. Continued study of pattern making with flat pattern in advanced shapes for the stage. Fall. Adamson.


245 ADVANCED COSTUME DESIGN I (Var.). Prerequisite, admission to the first year of M.F.A. program or permission of instructor. Study of design for the production student. Spring. Staff.

247 COSTUME LABORATORY III (1-3). Prerequisite, admission to the third year of the M.F.A. Costume program. Advanced practical work in the costume shop. Must be taken fall and spring. Adamson.

248 COSTUME CONSTRUCTION VI (1-3). Prerequisite, Dramatic Art 173. Continuation of the study of flat pattern using computer software with AutoCad. Spring. Adamson.

249 COSTUME PROGRAM INTERNSHIP (3-6). Intensive practicum in Costume Arts, with tutorial and class assignments on an individual basis as required. Fall or spring. May be repeated for credit. Adamson.

250 ADVANCED TECHNICAL DIRECTION (3-6). Prerequisite, admission to the second year of the M.F.A. Technical Production program. An advanced study of the management, technical, and engineering problems involved in theatrical production. Must be taken fall and spring. Roller.

251 M.F.A. TECHNICAL THEATRE PRACTICUM I (3-6). Prerequisite, admission into the M.F.A. Tech program. Practical work in stage shop. Must be taken fall and spring. Roller.

252 M.F.A./TECH PRACTICUM II (3-6). Prerequisites. Dramatic Art 251 and admission to the second year of the M.F.A. Tech program. Advanced practical work in stage shop. Must be taken fall and spring. Roller.

259 TECH INTERNSHIP (6-12). Intensive practicum in production projects for departmental and PlayMakers Repertory Company productions, with independent studies assigned to a student basis. May be repeated for credit. Staff.

260 TECHNICAL PLANNING AND PRODUCTION (3-6). Prerequisite, admission into the third year of the M.F.A. Technical Production program. Intensive practicum in production projects for departmental and PlayMakers Repertory Company productions. Must be taken fall and spring. Roller.

262 ADVANCED LIGHTING DESIGN (3). This course acquaints the student with professional practice in lighting design through lecture by faculty and visiting professionals and through evaluation of lighting designs executed by students and critiqued by professionals. Permission of the instructor required. Spring. Genocio.

393 THESIS (1-6). Staff.

CURRICULUM IN ECOLOGY

BRUCE P. WINTERHALDER, Chair

Professors
Richard N. Andrews (32) Environmental Policy and Planning, Impact Assessment
Lawrence E. Band (6) Watershed Hydrology, Ecology and Morphology
J. Robert Cox Jr. (1) Contemporary Rhetorical Theory, Environmental Advocacy
Douglas J. Crawford-Brown (43) Environmental Risk Assessment
J. Alan Feduccia (3) Ecology and Evolution of Vertebrates
David E. Greenland (5) Earth Surface Energy Exchange, Climate and Vegetation, Climate of the Pacific Northwest
John D. Kasarda (9) Human Ecology, Urban Sociology
Paul W. Leslie (40) Human Ecology, Demographic Anthropology, Population Genetics
Melinda Meade (36) Human Ecology, Demography, Ecology of Third World Development
Charles H. Peterson (29) Marine Ecology, Intertidal Communities
Frederic K. Pfaender (27) Environmental Microbiology, Estuarine Pollution
Peter J. Robinson (17) Climatology, Future Climate, Climatic Impacts
Alan E. Stirn (19) Population and Community Ecology, Ecological Genetics
Peter S. White (15) Plant Community Ecology and Conservation Biology
R. Haven Wiley (21) Behavioral Ecology of Vertebrates, Avian Behavior
Bruce P. Winterhalder (30) Human and Cultural Ecology, Foraging and Hunting Strategies, Andean South America

Associate Professors
Philip R. Berke (23) Sustainable Development, Environmental and Land Use Planning, Natural Hazards Mitigation
John W. Florin (33) Population and Medical Geography
David W. Pfennig (44) Ecology and Evolution
Stephen C. Whalen (7) Limnology, Wastewater Treatment Processes
Thomas M. Whitmore (42) Cultural Ecology, Latin America, Population

Adjunct Professor
Robert Wyatt, Ecology and Evolution of Plant Reproduction
Research Professor
Richard E. Bilibower (4) Economic Demography, Population, Development and the Environment

Professors Emeriti
Nelson G. Haistock
Richard J. Kope
Edward J. Kuenzler
Elizabeth A. McMahan
Helmut C. Mueller
Albert E. Radford
Charles M. Weiss
Richard A. Yamell

Using the resources of many departments, the Curriculum in Ecology (www.unc.edu/depts/ecology) provides both broad and specialized training in ecology. Whereas degree programs with a strong ecology component may be arranged in biology, environmental sciences and engineering, sociology, anthropology, and others, the Curriculum in Ecology, by combining many approaches and methods, provides balanced ecological training including preparation for the study and management of natural and human impacted systems. Degrees available in the ecology curriculum are the Master of Science, the Master of Arts, and the Doctor of Philosophy.

For the ecology degrees, course work is required in the following fields: natural sciences including behavior and physiology, population biology, and community and ecosystem ecology; plus atmospheric, terrestrial, and aquatic sciences; sociosciences including cities and migration, human population dynamics, social organization, human ecology, and environmental policy.

Preparation for careers in ecology also requires firm grounding in mathematics, computer science, the physical and chemical sciences, statistics, geographic information systems, remote sensing, and systems analysis and experimental methods. Undergraduate preparation may include a major in a biological science, social science, or in environmental science.

Facilities available for special study include computers, remote sensing, GIS, computer cartography laboratories, the North Carolina Botanical Garden and Mason Farm Biological Reserve, the Institute of Marine Sciences at Morehead City, Highlands Biological Station in the mountains, University Lake, Jordan Lake, Duke Forest, New Hope Creek, greenhouses, and ecological equipment administered by the supporting departments.

Strong ecological facilities and research programs are available in sister institutions at NCSU and Duke University, and members of these facilities may serve on student committees. The University of North Carolina at Chapel Hill is a member of the Organization for Tropical Studies, which provides opportunities for field study in Costa Rica and other tropical areas.

Requirements for Admission
For admission to the Curriculum in Ecology, an undergraduate degree is required in a natural science such as physics, chemistry, biology, bacteriology, botany, zoology, geology; a social science such as anthropology, sociology, or economics; a mathematical area such as statistics, mathematics, or systems analysis; an engineering area; or environmental science. Students are advised to develop a broad undergraduate science major with as many as possible of the following courses: calculus; computer science; general physics; analytical, organic, and physical chemistry; general botany and zoology; geology; anthropology; sociology; invertebrate zoology or paleontology; general ecology; physiology; and statistics. Application for admission and graduate appointments accompanied by credentials and Graduate Record Examination scores should be submitted by January 1.

Degree Requirements
Every student selects either the natural sciences or the social sciences as the principal research area; the other automatically becomes the supporting research area. Each student must gain substantial knowledge in both areas to qualify for the graduate degree.

Doctor of Philosophy
The overall course requirements are to be determined by the student's advisory committee. All the courses in the supporting research area (either natural sciences or social sciences) cannot come from the same discipline. Typically two or more disciplines are represented. ECOL 199 (or an equivalent specified by the curriculum) must be taken once but cannot count towards the principal or supporting course load. In the principal research area there is rarely a shortage of course work, but the general guideline is that a minimum of fifteen hours should be taken. There are only a few specific course requirements. All incoming students must take ECOL 190 (or an equivalent specified by the curriculum) in the fall semester in which they enroll, and each student must take one ECOL 199 (or an equivalent specified by the curriculum) course during the first two years of residence. All students must register for one semester of ECOL 201 in the semester in which they present a seminar on their research results. Doctoral students must register also for ECOL 394 for three hours credit.

Requirements for the dissertation, written and oral examinations, admission to candidacy, residency, and final examinations are as provided in the regulations for the Graduate School. Foreign language competence is at the discretion of the student's advisory committee. A semester of teaching experience equivalent to six laboratory contact hours per week is also required.

Master of Arts
The Master of Arts degree program requires that (a) both core areas be represented in the graduate major; (b) the student register for one semester in either ECOL 190 (or an equivalent specified by the curriculum) or ECOL 199 (or an equivalent specified by the curriculum) plus ECOL 201, and (c) the student participate in an organized learning experience in an environment other than the immediate Chapel Hill area. Master's degree course requirements are a minimum of nine credit hours in each of the principal and supporting research areas. Master of Arts students must register for ECOL 393 for at least 3 hours. One semester of field work is recommended (ECOL 202).

Requirements for the thesis, admission to candidacy, residence, and final examinations are provided in the regulations of the Graduate School.

Master of Science
Requirements for the Master of Science are the same as those for the Master of Arts, except: a Master of Science paper is prepared (ECOL 392) in place of a master's thesis (ECOL 393).

Ecology Core Areas
(Detailed descriptions are found under the department that offers each course.)

Natural Sciences
Anthropology 117, 203, 204, 260,* 266
Biology - All Biology courses listed below under "Biology"
Environmental Sciences and Engineering 132, 133, 134, 191, 200, 321, 324
Environmental Sciences and Studies 103
Geography 112, 114, 116, 141, 144, 145,* 177, 190, 191, 192, 205, 210, 290, 303, 308, 309, 314
Marine Sciences - All Marine Sciences courses listed below under "Marine Sciences"
Epidemiology 160

Social Sciences
Anthropology 139, 255, 260**
Biostatistics 164, 170
City and Regional Planning 124, 240, 244, 245
Economics 111, 165, 265
Environmental Sciences and Engineering 153, 283, 284
Geography 132, 134, 145, ** 150
Sociology 153, 171, 207, 212, 213, 218, 287
*Can also count as social science
** Can also count as natural science

Courses in the Ecology Curriculum
190 CONSERVATION AND SUSTAINABLE DEVELOPMENT (3). Fall. Staff.
199 CURRENT ISSUES IN ECOLOGY (3). Prerequisites, previous course work in ecology and permission of the instructor required. Topics vary but focus on interdisciplinary problems facing humans and/or the environment. Staff.
201 SEMINAR IN ECOLOGY (3). Prerequisite, graduate standing in ecology. Topics and problems in ecological research. Staff.
202 FIELD EXPERIENCE IN ECOLOGY (2). Prerequisite, graduate standing in ecology. Organized field work in remote environments with a faculty instructor as approved by student's supervisory committee. May be taken more than once. Staff.
250 Special Topics in Ecology (2-4). Prerequisite, permission of the instructor. Staff.
300 RESEARCH IN ECOLOGY (2 or more). Staff.
392 MASTER OF SCIENCE PAPER (3-5). Staff.
393 MASTER OF ARTS THESIS (3-6). Staff.
394 DOCTORAL DISSERTATION (3 or more). Staff.
   Ecological courses in other departments that are considered appropriate for the major in the Ecology Curriculum:

Anthropology
117 EVOLUTIONARY PERSPECTIVES ON HUMAN ADAPTATION AND BEHAVIOR (3). Fall. Winterhalter.
139 ENVIRONMENTAL ANTHROPOLOGY (3). Fall. Staff.
203 EVOLUTION AND ECOLOGY (3). Fall. Staff.
204 EVOLUTION AND ECOLOGY (3). Spring. Staff.
255 SEMINAR IN CULTURAL ECOLOGY AND POPULATION (3). Spring. Staff.
260 SEMINAR IN HUMAN EVOLUTIONARY ECOLOGY (3). (Alternate years.) Winterhalter.
266 SEMINAR IN ETHNOBOTANY (3). Spring. Staff.

Biology
126 OCEANOGRAPHY (3). Staff (MASC).
132 EVOLUTIONARY MECHANISMS (3). Spring. (Alternate years.) Stiven.
140 BIOLOGICAL OCEANOGRAPHY (4). Summer. Staff (MASC).
142 PLANT ECOLOGY (4). Fall. (Alternate years.) Peet.
143 ECOLOGICAL PLANT GEOGRAPHY (3). Fall. (Alternate years.) Peet.
145 EXPERIMENTAL METHODS IN ECOLOGY AND EVOLUTION (3). Spring. (Alternate years.) Stiven.
147 FIELD ECOLOGY (4). Spring. (Alternate years.) Reice.
150 ANIMAL SOCIETIES AND COMMUNICATION (3). Spring. (Alternate years.) Wiley.
151 BEHAVIORAL ECOLOGY (3). Fall. (Alternate years.) Staff.
184 CONSERVATION BIOLOGY (3). (On occasion.) White.
185 POPULATION ECOLOGY (3). Spring. (Alternate years.) Stiven.
185L LABORATORY IN POPULATION ECOLOGY (1). (Same as BIOL 185.) Reice.
186 COMMUNITY AND SYSTEMS ECOLOGY (3). Spring. (Alternate years.) Reice.
186L LAB IN COMMUNITY AND SYSTEMS ECOLOGY (1). (Same as BIOL 186.)
195 FIELD BIOLOGY AT HIGHLANDS BIOLOGICAL STATION (1-4). Summer. Staff.
213 ADVANCED MARINE ECOLOGY (3). Spring. IMS staff.
247 FIELD PLANT GEOGRAPHY (2). Spring. (Alternate years.) Peet.
255 SEMINAR IN ECOLOGY (2). Peet, Reice, Stiven, White.
259 SEMINAR IN COMPARATIVE ANIMAL BEHAVIOR (2). Fall or spring. Lohmann, Wiley.
265 SEMINAR IN MARINE BIOLOGY (2). Fall or spring. Kier, Podolsky.

Biostatistics
164 SAMPLE SURVEY METHODOLOGY (3). Spring. Kalbsbeek.
170 DEMOGRAPHIC TECHNIQUES I (3). Fall. Suchindran, Bilsborrow.

City and Regional Planning
124 URBANIZATION AND PLANNING IN DEVELOPING COUNTRIES (3). Fall. Lacey, staff.
240 LAND USE AND ENVIRONMENTAL POLICY (3). Fall. Berke.
244 DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT (3). Fall. Kaiser.
245 DEVELOPMENT IMPACT ASSESSMENT (3). Spring. Berke, Khattak, Burby, staff.

Economics
111 RESOURCE AND ENVIRONMENTAL ECONOMICS (3). Fall and spring. Staf.
165 ECONOMICS OF POPULATION (2). Fall or spring. Turchi.
265 ECONOMICS AND POPULATION (3). Spring. Turchi.

Environmental Sciences and Engineering
132 LIMNOLOGY (3). Fall. Whalen.
134 ECOLOGICAL MICROBIOLOGY (3). Spring. Pfander.
153 ENVIRONMENTAL MANAGEMENT AND POLICY (3). Fall. Andrews.
191 HEALTH EFFECTS OF ENVIRONMENTAL AGENTS (3). Fall. Ball.
200 ECOLOGY OF AQUATIC PLANTS AND WETLAND SYSTEMS (3). Wexel.

283 ENVIRONMENTAL LAW (3). Fall. Heath.

284 WATER RESOURCES PLANNING AND POLICY ANALYSIS (3). Fall. Moreau.


324 CHEMISTRY OF HUMIC SUBSTANCES (1). Fall. Christman.

Environmental Sciences and Studies
103 ECOLOGICAL PROCESSES IN ENVIRONMENTAL SYSTEMS (4).
Spring. Staff.

Epidemiology
160 PRINCIPLES OF EPIDEMIOLOGY (3). Fall and spring. Schoenbach, Alexander.

Geography
112 SYNOPTIC METEOROLOGY (3). Konrad.

114 PHYSICAL CLIMATOLOGY (3). Konrad, Robinson, Greenland.

116 APPLIED CLIMATOLOGY (3). Robinson, Konrad.

132 THE WORLD'S FOOD SUPPLY (3). Hawley, Meade.


141 INTRODUCTION TO WATERSHED SYSTEMS (3). Band.

144 LANDSCAPE BIOGEOGRAPHY (3). Moody.

145 MEDICAL GEOGRAPHY (3). Fall. Meade.

150 POPULATION GEOGRAPHY (3). Florin, Meade, Whitmore.

177 INTRODUCTION TO REMOTE SENSING AND DIGITAL IMAGE PROCESSING (3). Fall. Moody.

190 QUANTITATIVE METHODS IN GEOGRAPHY (3). Gesler, Konrad.

191 INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS (3).
Fall. Moody, Walsh.

192 APPLIED GEOGRAPHIC INFORMATION SYSTEMS (3). Spring. Walsh, Moody.

205 ADVANCED QUANTITATIVE METHODS IN GEOGRAPHY (3). Gesler, Moody.

210 ADVANCED PHYSICAL GEOGRAPHY (3). Band, Greenland.

290 SPATIAL ANALYSIS AND COMPUTER MODELING (3). Gesler.

303 SEMINAR IN GEOGRAPHIC INFORMATION SYSTEMS (3). Walsh.

308 SEMINAR IN PHYSICAL GEOGRAPHY (3). Walsh, Moody.

309 SEMINAR IN MEDICAL GEOGRAPHY (3). Meade, Gesler.

314 SEMINAR IN CLIMATOLOGY (3). Konrad, Robinson.

Marine Sciences
101 OCEANOGRAPHY (3). Staff.

104 BIOLOGICAL OCEANOGRAPHY (4). Lindquist. Staff.


106 PHYSICAL OCEANOGRAPHY (4). Fall. Bane.

110 GLOBAL CHANGE (3). Fall. Alperin.

125 COASTAL SEDIMENTARY ENVIRONMENTS (3). Spring. (Alternate years.) Wells, Martens.


146 MARINE ECOLOGY (3). Spring. (Alternate years.) Peterson.

199 SPECIAL TOPICS IN MARINE SCIENCES (2-4). Fall, spring, and summer. Staff.

215 MARINE MYCOLOGY (6). On demand at IMS. Kohlmeyer.

Sociology
153 SOCIAL CHANGE IN LATIN AMERICA (3). Smith.

171 URBAN PUBLIC POLICY (3). Staff.

207 MEASUREMENT AND DATA COLLECTION (3). Enwise.

212 DEMOGRAPHY: THEORY, SUBSTANCE, TECHNIQUES, PART I (3).
Rindfuss, Uhlenberg, Enwise, Harris.

213 DEMOGRAPHY: THEORY, SUBSTANCE, TECHNIQUES, PART II (3).
Rindfuss, Uhlenberg, Enwise, Mouw.

218 HUMAN ECOLOGY (3). J. Blau, Nielsen.

287 MIGRATION AND POPULATION DISTRIBUTION (3). (On demand.)
Uhlenberg.

DEPARTMENT OF ECONOMICS

JOHN S. AKIN, Chair

Professors
John S. Akin (1) Health Economics, Public Finance, Human Resources
Gary A. Biglaiser (63) Microeconomic Theory, Industrial Organization
Stanley W. Black (53) International Monetary Theory
David M. Blau (61) Labor Economics
William A. Darby Jr. (54) Economic Development, Monetary Theory
Richard T. Froyen (7) Macroeconomics, Monetary Policy
A. Ronald Gallant (73) Econometrics
Eric Gyhues (86) Econometrics
David K. Guillek (39) Econometrics
Claudio Mezzetti (71) Microeconomic Theory
Thomas A. Mroz (68) Labor Economics
James L. Murphy (21) Econometrics
Paul W. Rhode (69) Economic History
Steven S. Rosefielde (26) Comparative Economic Systems
Michael K. Salen (38) Macroeconomics, Monetary Economics
John F. Stewart (36) Industrial Organization
Helen V. Tauchen (40) Applied Microeconomics

Adjunct Professor
Peter Codanis

Associate Professors
Donna B. Gillespie (81) Health Economics, Econometrics
William R. Parke (65) Econometrics
Koleman S. Strumpf (74) Public Finance
Boone A. Turchi (31) Demography
H. Wilbert Van der Klaauw (85) Labor Economics

Adjunct Associate Professor
Rachel A. Willis
Assistant Professors
Evan Anderson (84) Macroeconomics
Thomas Geraghty (88) Economic History
Alexander Kowalenko (82) Microeconomic Theory, General Equilibrium
Sergio Parreira (89) Game Theory, Microeconomics
Chao Wei (90) Macroeconomics
Xiaodong Wu (87) International Economics

Professors Emeriti
Dennis R. Appleyard
Arthur Benavie
James W. Friedman
James C. Ingram
David McFarland
Thomas J. Orsagh
Ralph W. Pfeifer
Vincent J. Tarascio
Roger Waad
James A. Wilde

The graduate program in the Department of Economics prepares students for teaching and research careers in the fields of econometrics, economic history, financial econometrics, health economics, international trade and development, labor economics, microeconomic theory/industrial organization, and monetary and open economy macroeconomics. During the first year of the program students concentrate on the core areas of econometrics, macroeconomics, and microeconomics. Later, each student chooses two fields of specialization within those mentioned. The department's objective is to provide students with a broad training in theory and econometrics and with specialization in the major and minor fields.

A number of students supplement their study in economics at UNC-Chapel Hill with work in finance, statistics, mathematics, biostatistics, urban and regional studies, computer science, and operations research along with courses at Duke University and North Carolina State University. Strong offerings in these and other related areas enhance the overall graduate training offered to students.

Master of Science
The focus of the graduate program in economics is on the doctorate offerings. Most of the students in the master's program have already been admitted to a Ph.D. or professional program at UNC-Chapel Hill.

The Master of Science program requires Economics 200, 202, and 210, one course in Econometrics (170, 272, or 273), two courses in a major field, three electives, and a research course (Economics 392). All courses except the electives must be at the 200 level. Courses are to be selected in consultation with and with the approval of the director of graduate studies. The master's degree also requires a research paper and a comprehensive master's exam.

Doctor of Philosophy
Course Requirements. A doctoral candidate must complete fifteen Ph.D. level courses plus two semesters of the doctoral dissertation course Economics 394. Unless otherwise specified by the faculty in the major field, at least twelve of the fifteen courses must be from the Economics Department. All courses must be approved by the director of graduate studies.

Courses in the Fundamentals of Economics. The following seven courses or their equivalents are required: Economics 200, 201, 202, 203, 210, 271, and one additional econometrics course.

Courses in the Major and Minor Fields within Economics. Each student selects a major and a minor field from among the following fields within economics:

- Econometrics
  - Economic History
  - Financial Econometrics
  - Health Economics
  - International Trade and Development
  - Labor Economics
  - Microeconomic Theory/Industrial Organization
  - Monetary and Open Economy Macroeconomics

At least three courses in the major field and two courses in the minor field are required. One of the courses in the major field is usually a seminar course.

Courses in Supporting Field. The remaining courses are supporting courses chosen by the student in consultation with the director of graduate studies and other faculty. The supporting courses may be within the major or minor field or in areas that complement the major and minor fields.

Foreign Language-Research Skill. Additionally, a student must demonstrate competence in one foreign language or fulfill a research skill requirement. Courses satisfying the research skill requirement are usually in econometrics, quantitative methods, mathematics, statistics, or computer science.

Doctorate Exams and Dissertation. Students must pass qualifying exams in macroeconomics, microeconomics, and the major field. The faculty in each field determine whether the major field qualifier is a four-hour written exam or a paper. The qualifiers are given in August and January of each academic year; major field papers are due during the week of written exams. The three-hour macroeconomics and microeconomics qualifying exams are first taken in August of the second year and the major field qualifier in August of the third year. The exams are also given in early January.

Students have two chances to pass each of the exams and may petition the Appeals Committee for permission to take an exam for the third time.

The Graduate School Handbook describes the requirements for the doctoral oral exam, doctoral dissertation, and final oral defense of the dissertation. The doctoral oral exam includes an evaluation of the thesis prospectus.

The general regulations of the Graduate School apply to students receiving graduate degrees in economics from the University of North Carolina at Chapel Hill.

Fellowships and Assistantships. The department offers several fellowships and a number of research and teaching assistantships. All applicants to the Ph.D. program are considered for financial support, and most students enrolled in the Ph.D. program receive a stipend, tuition assistance, and health insurance from departmental or other University sources. Detailed information regarding the fellowships, assistantships, and instructorships may be obtained from the director of graduate studies in economics or from www.unc.edu/depts/econ.

Courses for Graduates and Advanced Undergraduates
NOTE: Economics 10 or equivalent with a grade of C or better is a prerequisite to all listed courses in Economics.

100 MICROECONOMICS: THEORY AND APPLICATION (PUPA 100) (3).
Analysis of the ways consumers and business firms interact in a market economy. Students may not receive credit for both Economics 100 and 101. Fall and spring.

101 INTERMEDIATE THEORY: PRICE AND DISTRIBUTION (3).
Prerequisite, Mathematics 22 or equivalent. The determination of prices and the distribution of income in a market system. Fall and spring.

111 RESOURCE AND ENVIRONMENTAL ECONOMICS (3).
Prerequisite, Economics 101 or permission of the instructor. Overview of the economic theory and analytical tools involved in understanding environmental and resource problems. Focus on economic issues involved in: air and water pollution, natural environments, exhaustible resources and energy. Fall and spring. (Not regularly offered.)
130 MACROECONOMICS: THEORY AND POLICY (3). Analysis of economic theory and government policy as they relate to such national economic variables as output, income, employment, inflation, investment, and budget and trade deficits. Students may not receive credit for both Economics 130 and 132 or both Economics 130 and 185. Fall and spring. Staff.

132 INTERMEDIATE THEORY: MONEY, INCOME, AND EMPLOYMENT (3). An introduction to contemporary macroeconomic concepts and analysis. Topics include the level, fluctuations, and growth of national income; and monetary and fiscal policies designed to achieve economic goals. Fall and spring. Staff.

135 ECONOMIC HISTORY OF THE UNITED STATES (3). Main features of the American economy from colonial times to the present. Fall and spring. Geraghty, Rhode.

138 ECONOMIC DEVELOPMENT OF THE UNITED STATES (3). Prerequisites, Economics 101 and 132. Students may receive credit for either Economics 135 or Economics 138 but not for both. This course parallels Economics 135 but is designed for students with a higher level of theoretical preparation. Rhode.

140 INTRODUCTION TO PUBLIC FINANCE (3). Principles and practices of the budgetary activities of American governments -- federal, state, and local. Students may not receive credit for both Economics 140 and 141 or both Economics 94A and 140. Fall. Wilde.

141 ANALYSIS OF PUBLIC FINANCE (3). Prerequisite, Economics 101. Application of economic analysis to the taxing and spending functions of government. Students may not receive credit for both Economics 140 and 141 or both Economics 94A and 141. Fall and spring. Strumpf, Wilde.

142 ADVANCED TOPICS IN PUBLIC FINANCE (3). Prerequisite, Economics 140 or 141. Selected topics in taxation, public expenditures, and governmental transfer programs. Fall. Strumpf, Wilde.

145 PUBLIC POLICY TOWARD BUSINESS (3). Prerequisite, Economics 100 or 101. Industry structure and its relation to performance; market imperfections; description and analysis of antitrust and regulation. Students may not receive credit for both Economics 145 and 147. Fall and spring. Biglaiser, Stewart.

147 INDUSTRIAL ORGANIZATION (3). Prerequisite, Economics 101. Theoretical and empirical development of structure-conduct-performance relationships in the industrial sector; description and analysis of United States industry. Students may not receive credit for both Economics 145 and 147. Fall and spring. Biglaiser, Stewart, Tauscher.


150 INTRODUCTION TO HEALTH ECONOMICS (3). Prerequisite, Economics 100 or 101. An economic analysis of the demand, production, and distribution of health care. Fall. Akin.


159 HISTORY OF ECONOMIC DOCTRINES (3). A survey of the fundamental forms of economic thought from the scholastics through Keynes. Fall.

160 EUROPEAN ECONOMIC INTEGRATION (3). Prerequisite, Economics 100 or 101 or permission of the instructor. Economic and political aspects of European economic integration, the EC customs union, barriers to integration, convergence versus divergence of inflation rates and income levels, enlargement of the EC. Fall or spring. Black.

161 INTERNATIONAL ECONOMICS (PWAD 161) (3). Prerequisite, Economics 100 or 101. An introduction to international trade, the balance of payments, and related issues of foreign economic policy. Fall and spring. Black, Conway, Field, Wu.

162 TOPICS IN INTERNATIONAL ECONOMICS (3). Prerequisite, Economics 161. Analysis and interpretation of selected problems and policy issues. Content varies, but attention is given to such topics as trade barriers, trade patterns, floating exchange rates, and international monetary policy. Black, Conway, Field, Wu.

163 ECONOMIC DEVELOPMENT (3). Prerequisite, Economics 100 or 101 or permission of the instructor. An introduction to the economic characteristics and problems of the less developed countries and to theories and policies applicable to the developing economy. Fall and spring. Conway, Darity, Field.

164 INTERNATIONAL ECONOMICS FROM THE PARTICIPANT'S PERSPECTIVE (3). Prerequisite, Economics 96 (INTS 96) or instructor's permission. This course examines the fundamental principles of international economics from the perspective of the private business firm. Rather than begin with abstract theory, the course will work with case studies of individual firms as they choose to (or are forced to) compete in an international marketplace. Fall. Conway.

165 ECONOMICS OF POPULATION (3). Prerequisite, Economics 100 or 101 or permission of instructor. Analysis of economic-demographic interrelations including demographic analysis, population and economic growth and development, economic models of fertility and migration, and population policy. Fall or spring. Turchi.

168 PRINCIPLES OF SOVIET AND POST-SOVIET ECONOMIC SYSTEMS (3). Prerequisite, Economics 100 or 101. Study of the principles, design, organization, and performance of state-controlled economies relying on planning or regulated markets, with an emphasis on continuity and post-communist transition. Fall. Rosefeld.

169 WESTERN AND ASIAN ECONOMIC SYSTEMS (ASIA 169) (3). Prerequisite: Economics 100 or 101. Policy seminar on the systemic factors distinguishing Western economies from their rivals in the former Soviet bloc and Asia, focused on conflict resolution and global integration. Fall. Rosefeld.

170 ECONOMIC APPLICATIONS OF STATISTICAL ANALYSIS (3). Prerequisite, Economics 70 or equivalent. Statistical methods in the construction, estimation, testing, and application of linear economic models; computer programs and interpretation of their output in empirical analysis of common economic theories. Fall or spring. Guilkey, Murphy, Stewart.

180 ECONOMICS OF THE FAMILY (3). Prerequisite, Economics 101 or permission of the instructor. Analyzes the family with respect to the marriage market, divorce, reproductive behavior, the baby black market, intrafamily allocation of goods, time and power, labor supply, migration, and family policy. Fall, spring. Turchi.


182 TOPICS IN MACROECONOMIC THEORY (3). Prerequisite, Economics 132. This course emphasizes theoretical and empirical topics such as growth, labor search, Phillips curves, stagflation, and optimal government policy. Fall. Anderson, Salem.

183 GAME THEORY IN ECONOMICS (3). Prerequisites, Economics 101 and Math 33 or permission of instructor. Topics in noncooperative and cooperative game theory are covered, along with a selection of applications to economics in areas such as industrial organization, international trade, public finance, and general equilibrium. Fall. Mezzetti.

185 FINANCIAL MARKETS AND ECONOMIC FLUCTUATIONS (3). Prerequisite, Economics 132. An examination of financial institutions and markets, their role in economic conditions, and the use of macroeconomic policies in affecting those conditions. Fall and spring. Conway, Proven, Parke, Salem.
190 THE ECONOMICS OF LABOR RELATIONS (3). Prerequisite, Economics 100 or 101. An economic analysis of workplace issues, including turnover, layoffs, and unemployment, discrimination and affirmative action, and the setting of pay, fringe benefits, and working conditions. Students may not receive credit for both Economics 190 and 194. Fall and spring. Blau, Mroz, van der Klauw.


194 LABOR ECONOMICS (3). Prerequisite, Economics 101. An introduction to the field of labor economics with emphasis on how the interactions between firms and workers influence wages, employment, unemployment, and inflation. Students may not receive credit for both Economics 194 and 190. Fall and spring. Blau, Mroz, van der Klauw.

195 TOPICS IN LABOR ECONOMICS (3). Prerequisite, Economics 194. A theoretical and empirical analysis of current social problems involving individuals and their jobs. Included are such topics as poverty, discrimination, and working conditions. Spring. Blau, Mroz.

199 SEMINAR IN ECONOMICS (3). Detailed examination of selected problems in economics and a critical analysis of pertinent theories. Fall and spring. Staff.

Courses for Graduates

Graduate standing in economics or permission of the director of Graduate Studies in Economics is required for all courses numbered 200 or higher.

200 ADVANCED MICROECONOMIC THEORY I (3). Prerequisite or corequisite, Economics 210. Consumer and producer theory, expected utility, perfect competition and monopoly, introduction to general equilibrium and welfare economics. Fall. Tauchen.

201 ADVANCED MICROECONOMIC THEORY II (3). Prerequisite, Economics 200 or equivalent. General equilibrium and welfare economics, game theory and oligopoly, information economics. Spring. Mezzetti, Kovalenkov.

202 ADVANCED MACROECONOMIC THEORY I (3). Prerequisite, Economics 132 or equivalent. Keynesian and classical equilibrium models; the neo-Keynesian synthesis; monetarist and other alternative analytic frameworks. Spring. Black, Froyen, Salemi.

203 ADVANCED MACROECONOMIC THEORY II (3). Prerequisite, Economics 202 or equivalent. Growth models, general equilibrium approach to monetary theory; input-output; disequilibrium theory; extensions of Keynesian and classical models. Fall. Anderson, Salemi.

207 GENERAL ECONOMIC THEORY (3). Prerequisite, graduate standing in a department other than economics. Theory of demand, production, market structures and economic welfare, national income accounts and theory of national income determination, unemployment, inflation. (Not regularly offered.)

210 BASIC QUANTITATIVE TECHNIQUES (3). Topics from linear algebra, calculus, linear and nonlinear programming, and the theory of difference and differential equations with applications to economics. Fall. Fall. Anderson, Salemi.

221 GAME THEORY I (3). Prerequisite, Economics 200, 201, or permission of the instructor. Non-cooperative games in strategic and extensive form, with perfect and imperfect information. Other topics from: information economics, mechanism design, auctions, repeated games, bargaining, bounded rationality, learning, evolutionary games, cooperative games. Fall, spring. Biglaiser, Kovalenkov, Mezzetti.

222 PRODUCTION THEORY AND MODELLING (3). Prerequisites, Economics 200, 201. Topics in production theory and the modeling of producer behavior, using duality theory and focusing on static and dynamic models, alternative behavioral objectives and constraints, and functional forms. (Not regularly offered.)

224 DYNAMIC MODELS IN MICROECONOMICS (3). Prerequisites, Economics 200, 201. Discussion of microeconomic issues in which the dynamic structure has an essential role. Presentation of dynamic models appropriate for examining the economic issues. (Not regularly offered.)

225 GAME THEORY II (3). Prerequisite, Economics 221 or permission of instructor. This course is a continuation of Economics 221. Topics covered will be chosen from those listed, but not covered in Economics 221. Fall, spring. Biglaiser, Kovalenkov, Mezzetti.


236 MODERN ECONOMIC HISTORY (3). Prerequisite, Economics 235 or permission of the instructor. Economic change in modern Western societies. Comparative study of growth in Europe and North America. Fall or spring. Rhode.

240 ADVANCED PUBLIC FINANCE: EXPENDITURE (3). Analysis of market failure and reasons for public spending, cost-benefit analysis and program budgeting, public decision making, redistribution and fiscal equity, intergovernmental transfers. Spring. Strumpf. (Not offered 2001/2002.)

241 ADVANCED PUBLIC FINANCE: REVENUES (3). Prerequisite, Economics 240 or permission of the instructor. Criteria for judging tax structures, incidence and impact of taxation, user charges and debt finance, intergovernmental coordination, and macroeconomic effects. Spring. Strumpf. (Offered 2001/2002.)

245 ADVANCED BUSINESS ORGANIZATION AND SOCIAL CONTROL (3). Prerequisite, permission of the instructor. Extensive readings in the literature are required. Emphasis is placed upon the role of economic analysis in dealing with problems in this field. (Not regularly offered.)

248 ECONOMIC REGULATION OF INDUSTRY (3). Economic regulation in theory and practice. Principles of optimal regulation are developed, and regulatory performance in various industries is appraised. Fall or spring. Biglaiser.

250 HEALTH ECONOMICS (3). Prerequisite, Economics 200 and 272 or permission of the instructor. Measurement and modeling of the demand for medical care, the demand for and supply of health insurance, and the incorporation of health, medical care, and health insurance in determining both short and long run labor supply. Fall. Akin, Gilleseke.

251 HISTORY OF ECONOMIC THOUGHT I (3). A survey of the development of economic thought from the seventeenth century to the present, with particular emphasis on doctrines reflected in modern economic theory. (Not regularly offered.)

252 HISTORY OF ECONOMIC THOUGHT II (3). A study of economic doctrines from the nineteenth century to the present in a methodological perspective. (Not regularly offered.)

253 SOCIALIST ECONOMIC THOUGHT IN HISTORICAL PERSPECTIVE (3). A systematic study of the development of socialist economic theory from Owen to Cohen-Bendit, emphasizing Marx, Russian Marxism, and contemporary Marxist economic theory. (Not regularly offered.)

255 HEALTH ECONOMICS FOR DEVELOPING COUNTRIES (3). Prerequisite, Economics 200 and 272 or permission. Major topics are: how health and development are related, the demand for health services, cost-benefit and cost-effectiveness analysis, and methods for financing health care in developing, resource-constrained nations. Fall or spring. Akin.

261 THEORY OF INTERNATIONAL TRADE (3). Prerequisite, graduate standing in economics or permission of the instructor. The theory of international values, comparative advantage and the gains from trade, commercial policy. Fall or spring. Conway, Field, Wu.

262 INTERNATIONAL MONETARY ECONOMICS (3). Prerequisite, graduate standing in economics or permission of the instructor. Analysis of the international
monetary system, exchange rates, the process of adjustment in the balance of payments. Fall or spring. Black, Conway.

263 ECONOMIC DEVELOPMENT: THEORY AND POLICY (3). Prerequisite, permission of the instructor. Intensive study of the development processes and problems of the less developed countries, with emphasis on theories of growth and development, internal and external policies, and planning strategies. Fall or spring. Conway, Darby, Field.

264 SELECTED TOPICS IN ECONOMIC DEVELOPMENT AND DEVELOPMENT PLANNING (3). Prerequisite, Economics 263 or equivalent. Examination of various topics in economic progress of the less developed countries, with special emphasis on the role of international issues. Fall or spring. Conway, Darby, Field.

265 ECONOMICS AND POPULATION (3). Prerequisite, graduate standing in economics or permission of the instructor. Analysis of economic-demographic interrelationships including population and economic development; population, environmental decay, and zero population growth; models of fertility, migration, and spatial organization; population policy. Spring, Tuichi. (Not regularly offered.)

267 COMPARATIVE ECONOMIC SYSTEMS (3). This course focuses on alternative theories of United States capitalism, French indicative planning, Yugoslavian worker-managed market socialism, Soviet central planning, and the Chinese worker-controlled decentralized planning model. (Not regularly offered.)


272 ECONOMETRICS (3). Prerequisite, Economics 271 or equivalent. One semester coverage of basic econometrics. Topics include: regression under ideal and nonideal conditions; special models, including simultaneous equations models; and applications and econometric computer programs. Spring, Guilek, Mroz.

273 ADVANCED ECONOMETRICS (3). Prerequisites, Economics 271, Economics 272, and Mathematics 147. Economics 273 constitutes a one-semester treatment of the fundamental theory of econometrics. Topics covered include asymptotic distribution theory, linear and nonlinear models, specification testing techniques, and simultaneous equations models. Fall, Gallant, Guilek, Parke.

274 TIME SERIES ECONOMETRICS (3). Prerequisite, Economics 273. Covers stationary univariate and multivariate time series models, spectral analysis methods, nonstationary models with time trends, unit roots and cointegration, and special topics such as conditional volatility, the Kalman filter and changes of regime. Spring, Gallant, Ghysels, Parke.


281 MONETARY THEORY (3). Examination of theory and evidence on money demand, money supply, and portfolio analysis. Barter versus monetary economics, portfolio school, monetarism, monetary theories of interest rate determination. Fall. Black, Froyen, Salmi.

282 MONETARY POLICY (3). Prerequisite, Economics 202 or permission of the instructor. Optimal policy under uncertainty, financial intermediation and monetary control, channels of monetary influence, monetary policy and inflation, rules versus authority. (Not regularly offered.)


291 LABOR ECONOMICS I (3). Prerequisite, Economics 200 or permission of the instructor. Analysis of the short-and long-run aspects of supply and demand of labor, including empirical analysis of the labor force behavior of males, females, blacks, and whites. Topics include the macroeconomic effects of marriage, fertility, and mobility on labor supply, as well as the macroeconomic effects of unemployment on inflation. Fall or spring. Blau, Mroz.

292 LABOR-MANAGEMENT RELATIONS (Business Administration 292) (3). An advanced study of the procedure, subject matter, and legal framework of collective bargaining. (Not regularly offered.)

294 LABOR ECONOMICS II (3). Life cycle analysis of supply and demand for labor as a determinant of individual wages. Topics include an analysis of discrimination, union power, and governmental manpower policies on the distribution of earnings across the population. Fall or spring. Blau, Mroz, van der Klaauw.

300 SEMINAR IN MICROECONOMIC THEORY I (3). Prerequisites, Economics 200 and 201. Seminar study of advanced topics in microeconomic theory. (Not regularly offered.)

301 SEMINAR IN MACROECONOMIC THEORY II (3). Prerequisites, Economics 202 and 203. Seminar on advanced topics in macroeconomic theory. (Not regularly offered.)

311 SEMINAR IN TEACHING METHODS IN ECONOMICS (3). Prerequisite, doctoral candidacy in economics or permission of the instructor. Covers skills in lecturing, encouraging student participation and active learning, writing exams, planning and evaluating courses. Students design and teach a module that includes class discussion and hands-on learning. Fall or spring.

335 SEMINAR IN ECONOMIC HISTORY (9). Relation of economic history to economics: history of work in the field. Current problems and techniques of study and research. (Not regularly offered.)

341 RESEARCH IN PUBLIC FINANCE (3). Prerequisite, permission of the instructor. Open to qualified graduate students who wish to make intensive studies in particular fields of public finance. Conference hours subject to arrangement. Written reports are normally required. (Not regularly offered.)

351 SEMINAR IN THE HISTORY OF ECONOMIC THOUGHT (3). Prerequisite, permission of the instructor. Advanced study of economic analysis beyond the scope of Economics 251 and 252. (Not regularly offered.)

355 RESEARCH IN HEALTH ECONOMICS (3). Prerequisites, Economics 250 and 255. Seminar on advanced topics in health economics. The course allows advanced graduate students to investigate topics beyond the coverage of the other health offerings and to begin to develop independent research in the area. (Not regularly offered.)

361 SEMINAR IN INTERNATIONAL ECONOMICS (3). Prerequisites, Economics 261 and 262 or equivalent. A directed reading and research course. Fall or spring. Black, Conway, Wu.

363 SEMINAR IN ECONOMIC DEVELOPMENT (3). Prerequisite, Economics 262 or equivalent. Directed reading and research on selected problems in economic development. Fall or spring. Conway, Darby, Field.

365 SEMINAR IN POPULATION (3). Prerequisite, graduate standing in economics. For advanced population students, this course addresses the newest and most advanced economic demography literature. (Not regularly offered.)

371 RESEARCH IN ECONOMETRICS (93). Prerequisites, Economics 273 and Economics 274, 275, or 276. Seminar on special topics in econometrics. (Not regularly offered.)
375 Seminar in Applied Microeconomics (3). Prerequisite: permission of the instructor. This course offers advanced graduate students the opportunity to begin to develop independent research in applied microeconomic fields. Fall or spring. Staff.

381 Seminar in Monetary Economics (3). Prerequisite: permission of the instructor. Advanced study of theoretical and applied topics in monetary economics. Fall or spring. Fryen, Salemni.

386 Introduction to Empirical Finance (Business Administration 386) (3). Corequisite or prerequisite, Economics 272. This course provides an introduction to the econometric techniques commonly applied to empirical issues in finance. Fall or spring. Ghyzel.

388 Advanced Topics in Empirical Finance (Business Administration 388) (3). Corequisites or prerequisites, Economics/Business Administration 386 and Economics 274. This course will cover a selected list of current empirical research topics in finance and related econometric methods. Fall or spring. Ghyzel.

391 Seminar in Labor (3). Prerequisite: permission of the instructor. This course offers mature students an opportunity to carry their investigations of significant matter beyond the limits of the formal course offerings. (Not regularly offered.) Fall and spring. Staff.

392 Master's Paper (3). Fall and spring. Staff.

394 Doctoral Dissertation (3). Fall and spring. Staff.

396 Seminar in Soviet Economics (3). Prerequisite: permission of the instructor. Studies of selected problems of the Soviet economy and related aspects of Soviet economic thought. Seminar members are expected to present reports on assigned research topics. (Not regularly offered.) Fall and spring. Staff.

SCHOOL OF EDUCATION

MADELINE R. GRUMET, Dean

Professors

Donald B. Bailey Jr. (002) Early Intervention, Family Support, Assessment
John C. Brantley (009) Psychoeducational Assessment, Professional Decision Making
Duane Brown (014) Elementary School Counseling, Center Development, Behavioral Consultation
Frank Brown (015) Policy Studies, School Law, Leadership and Administration
Richard H. Coop (017) Educational Psychology, Cognitive Development, Adolescent Development
James W. Cunningham (018) Reading and Language Arts
Barbara D. Day (019) Early Childhood Education
Jill Fitzgerald (024) Reading, Writing, Literacy Issues
Henry T. Frierson Jr. (026) Educational Psychology
John P. Galati Jr. (038) Counseling Psychology, Behavior Therapy, School Counseling
Madeleine R. Grumet (170) Culture, Curriculum, and Change
Audrey L. Heining-Broston (037) Foreign Language Education, English as a Second Language
Catherine Marshall (105) Policies: Qualitative Inquiry, Gender, Race, and Class Issues
Judith L. Mece (055) Educational Psychology, Measurement, and Evaluation, Elementary Education
James L. Morrison (056) Educational Planning, Evaluation, Policy Analysis
George W. Noblit (057) Sociology of Education, Qualitative Research Methods, Educational Leadership
Walter B. Pyszczynski (064) School Psychology, Consultation, Learning Disabilities
Rune J. Simonsen (073) Exceptional Child Development, Psychological Assessment, Primary Prevention
Dixie Lee Spiegel (075) Literacy and Literacy Education
Donald J. Stedman (076) Program Planning and Evaluation, Child Development
Alan R. Tom (136) Elementary Education: Culture, Curriculum, and Change

Gerald Unks (082) Culture, Curriculum, and Change
Lynne Vernon-Fegans, Early Childhood Intervention, Literacy
William B. Ware (085) Educational Psychology, Measurement, and Evaluation, Research Design Analysis

Associate Professors

Harriet A. Boone (149) Early Intervention, Family Support and Ethics
Gregory J. Cizik (176) Educational Assessment and Evaluation
Susan Friel (115) Mathematics Education
Wallace H. Hannum (034) Instructional Design, Theories of Instruction, Computer Applications
M. Gail Jones (047) Science Education, Middle Grades Education, Gender Issues in Education
Pauls Lane, Science Education
Carol E. Malloy (157) Influence of Culture on Mathematical Problem-Solving, Gender and Equity Issues
William W. Malloy (130) Educational Leadership, Special Education
Rita O'Sullivan (186) Educational Assessment and Evaluation
Dwight L. Rogers (067) Early Childhood/Elementary Education, Moral Dimensions of Teaching, Teachers as Reflective Practitioners
Xue Lan Rong (146) Social Studies Education, Social Foundations of Education, Large Data-Set Research
Lynda Stone (147) Philosophy of Education, Social Theory, Feminism

Assistant Professors

Daniel Boudah (181) Special Education - Middle School and Secondary Grades
Kathleen Brown (182) Educational Leadership
Jill Ham (183) Adolescent Development
Mary Stone Hanley, Anesthetic Education
Ryoko Kubota (169) Foreign Language Education
David P. Levine (171) History of Education, Social Studies Education - Middle School and Secondary Grades
William Veal (172) Science Education - Secondary Grades
Margaret P. Weiss, Early Childhood, Family, and Literacy Studies

Research Professors

Donna Bryant, Special Education
H. Dickson Corbett, Social Foundations
Thelma Harms (035) Early Childhood Education
Pamela J. Winton (092) Families, Early Intervention, Preservice and Inservice Training
Mark Wolery, Special Education
Research Associate Professors

Virginia Bussy (159) Community-Based Programs for Young Children with Disabilities and Their Families
Richard M. Clifford (111) Public Policy, Early Education and Care, Public Finance
Gloria Harbin, Special Education
Gail S. Huntington, Special Education
Robert A. McWilliam (140) Early Intervention for Children with Disabilities

Research Assistant Professors

Dawn Carlson, School Psychology and Early Childhood
Edward M. Neal (174) Educational Assessment, Adult and Higher Education

Clinical Professors

Donald A. Boulton (007) Student Personnel, Higher Education
Roy A. Eddlefs (022) Teacher Education, Curriculum, Teaching
David L. Lillie (048) Individualized Instruction, Learning Disabilities, Technology Applications in Education
Bobbie B. Luker (049) Special Education, Epidemiology of Language Disorders in Exceptional Children
Gerry Madrazo (106) Science Education
Russell J. Rowlett (068) Mathematics Education
Clarence N. York (153) Special Education
Clinical Associate Professors
Patricia S. Bewers (135) Middle School Preparation, Elementary Science
Mary Ruth Coleman (144) Learning Disabilities and Gifted Education
Susanne A. Culledge (033) Social Studies Education
Perry Harrison (165) Educational Leadership
Stephen R. Hooper (040) School Psychology, Child Neuropsychology, Child Psychopathology
Daniel M. Huff (102) Choral Music Education, Teacher Preparation, Teacher Socialization
Larry Mabe, Educational Leadership
Howard Manoff (110) Educational Leadership
Neil G. Pedersen
Stanley Schainker, Educational Leadership
Pascal Troschansis, Early Childhood, Family, and Literacy Studies
Rhonda M. Wilkerson (117) Strategies for Teaching to Learning Style Differences

Clinical Assistant Professors
Lyntete Ayers, School Psychology
Michael Biggsy (138) Crisis Intervention in Schools, Attention Deficit Disorder
Deborah Baker-Rich, Educational Foundations
Allison B. Ford, School Counseling
Timothy L. Hart, English as a Second Language
Wendy K. L. Lam, School Psychology
Glen A. Martin (051) Counseling Psychology
Sharon P. Maskel (052) Special Education
Jane McMillen, Child Development and Family Studies
Mary Penca (171) Educational Psychology
Annette Perso, School Counseling
Craig Pohlman, School Psychology
Renee Pribalan (172) Curriculum and Instruction
Denise Saunders, School Psychology
Erica Sheriff, Curriculum and Instruction
Carl W. Swartz (129) Teaching Decision Making, Learning Disabilities
Lynn Williford (173) Educational Psychology

Clinical Instructors
Thomas H. Cox, Technology
Carolyn F. Jones, Teacher Education
Donald E. Lowrance, Educational Leadership
Barbara H. Rhoades (116) Art Education
Retired Fixed-Term Professors
J. Hunter Ballew (003) Mathematics Education, Curriculum and Instruction
Gary B. Stuck (079) Educational Psychology, Learning, Evaluation

Professors Emeriti
Richard A. Brice
Linda Brooks
Carl F. Brown
William J. Burke
James J. Gallagher
R. Stellings Hennis Jr.
Samuel M. Holton
Paul B. Houshall
Richard C. Hunter
Annie Lee Jones
Mary Turner Lane
William S. Palmer
Richard C. Phillips
William C. Self
Roy E. Sommerfield
Neal H. Tracy
Eugene R. Watson
Kennard P. White
Ronald Wegerink
Ralph E. Wileman Jr.

The School of Education has attempted to present correct information as of the printing date of this Record. However, this information does not establish a contractual relationship and the school reserves the right to alter any statement when review is complete. Therefore, applicants should contact the School of Education to obtain updated information on programs prior to final application procedures.

The School of Education, in keeping with the general goals of the University of North Carolina at Chapel Hill, embraces a threefold mission of teaching, research, and service. With these purposes in mind, the school's graduate programs are designed to meet the needs of professional educators who seek to further their knowledge, understanding, and skills relating to educational processes. These professionals vary in their career orientations. Some are employed in or wish to become employed in educational institutions and others in agencies and organizations performing noninstructional educational functions.

The research mission involves continuing inquiry into the development of knowledge of the teaching-learning process, human development, the organization of schools and educational agencies, the historical and philosophical bases for educational institutions, and the processes of program development and implementation.

The service mission provides public and private institutions and agencies with the benefits of research and consultation, thereby enhancing these institutions and agencies' ability to satisfy their educational objectives.

The teaching mission involves the faculty and graduate students in applying the knowledge base in field settings and translating it in course work.

The School of Education is headed by Dean Madeline R. Grumet. She is assisted by the senior associate dean and the assistant dean for faculty personnel procedures.

Degree Programs
Note: Additional information may be found on the School of Education’s website at www.unc.edu/education.

The School of Education offers the following master's degrees: (1) the Master of Arts in Teaching (M.A.T.) in Secondary Education for English, Latin, mathematics, science, and social studies, and K-12 education for French, German, Japanese, Spanish, and music; (2) the Master of Arts (M.A.) in Education with three research strands (culture, curriculum and change; early childhood, family, and literacy studies; and educational psychology, measurement, and evaluation) and in School Psychology; (3) the Master of Education (M.Ed.) in Educational Psychology, School Counseling, and School Psychology; and (4) the Master of School Administration (M.S.A.) in Educational Leadership. The Graduate School administers all but the Master of School Administration programs, which the School of Education administers.

Two off-campus, part-time programs are offered: the Master of Education (M.Ed.) for experienced teachers and the Master of School Administration. The potential specialty areas for this program are: Early Intervention (birth through kindergarten); Elementary Education: Language Arts and Social Studies, and Mathematics and Science; Middle Grades Education: Language Arts, Mathematics, Science, and Social Studies; Secondary Education: English, Mathematics, Science, and Social Studies; K-12 and 9-12: Foreign Language Education; and K-12: Learning Disabilities, and Literacy Education (reading and writing).

The part-time, off-campus M.S.A. program is designed for working professionals and stretches the normal two-year program offered on campus over an extended period of three academic years and three summers. While the program emphasizes preparation for the school principalship, individuals with other educational career aspirations such as district-level leadership positions will find it appropriate.
Two doctoral degrees are offered: (1) the Doctor of Philosophy (Ph.D.) in Education (with three research areas: culture, curriculum, and change; early childhood family, and literacy studies; and educational psychology, measurement, and evaluation), and School Psychology; and the (2) the Doctor of Education in Curriculum and Instruction, and Educational Leadership. The Graduate School administers the Ph.D., while the School of Education administers the Ed.D.

Licensure

The School of Education recommends eligible graduates of its programs to the North Carolina State Department of Public Instruction for licensure as teachers, administrators, and other specialized school personnel in the public schools of North Carolina. In addition, the school recommends licensure candidates from the following University degree programs: the School of Information and Library Science (for school media coordinators), the School of Social Work (for school social workers), and graduates of the Speech Language Pathology program.

Certain (very limited) nondegree licensure programs offered by the School of Education in conjunction with the Office for Continuing Studies, provide a route for already-licensed educators who wish to add another area of licensure. Areas covered include early intervention and family support (birth through kindergarten and preschool), learning disabilities, English as a second language, reading K-12, and instructional supervision preparation for a system-level position.

The new Middle Grades Language Arts, Mathematics, Science, or Social Studies and/or English as a Second Language Licensure-Only Program is offered by the School of Education for initial, single or dual licensure.

Education Degree Requirements

The School of Education offers through the Graduate School the following degrees: M.A., M.Ed., M.A.T., Ed.D., and Ph.D.

M.A. Degree Requirements

1. A bachelor’s degree from a four-year college or university.
2. Completion of the minimum required number of semester hours of advanced course work. (Check with individual programs to ascertain the minimum requirements.)
3. Completion of at least two full semesters of residence.
4. Completion of all required and elective courses within five years of admission.
5. A grade of Pass on a written comprehensive examination.
6. A grade of Pass on an oral examination covering the entire field of study.
7. Satisfactory completion of a thesis.
8. Application for admission to candidacy, and the degree application to be filed together no later than the date specified in the academic calendar.

M.Ed. Degree Requirements

1. A bachelor’s degree from a four-year college or university.
2. Completion of the minimum required number of semester hours of advanced course work. (Check with individual programs to ascertain the minimum requirements.)
3. Completion of at least two full semesters of residence.
4. Completion of all required and elective courses within five years of admission.
5. A grade of Pass on a written comprehensive examination.
6. Application for admission to candidacy, and the degree application to be filed together no later than the date specified in the academic calendar.

M.A.T. Degree Requirements

1. A bachelor's degree from a four-year college or university.
2. The equivalent of an undergraduate major in the chosen subject area.
3. Completion of a minimum of thirty semester hours of advanced course work.
4. Completion of at least two full semesters of residence.
5. Completion of all required and elective courses within five years of admission.
6. Satisfactory completion of a comprehensive teaching portfolio that synthesizes course work and experiences as related to state and national standards.
7. Candidacy statement.

Ed.D. (Doctor of Education) Degree Requirements

1. A bachelor’s degree from a four-year college or university and a master’s degree in the field of education.
2. Completion of at least four semesters of graduate study, with at least two semesters of continuous residence at this university.
3. Completion of all required and elective courses within eight years of admission.
4. Completion of a minimum of twenty-four semester hours in the major area of concentration.
5. Completion of a minimum of twelve semester hours in the minor area.
6. A grade of Pass on a written comprehensive examination on the major and minor areas of concentration.
7. A grade of Pass on an oral examination covering the entire field of study.
8. Successful completion of a final oral examination which is the defense of the dissertation.
10. Application for admission to candidacy, and the degree application to be filed together no later than the date specified in the academic calendar.

Ph.D. Degree Requirements

In addition to the Graduate School requirements for the Ph.D., the School of Education also requires:
• full-time enrollment until all formal course work is completed; and
• completion of an individual program of studies comprised of required and elective courses.

Programs of Study

Master of Arts (M.A.) in Education

The M.A. in Education is designed for individuals from a variety of backgrounds who are interested in research in the field of education. The program should be of particular interest to individuals considering doctoral work in education but who have not yet completed a master’s. The M.A. in Education is not designed for students interested in receiving licensure.

Students select an area of specialized study from: culture, curriculum, and change; early childhood, family, and literacy studies; or educational psychology, measurement, and evaluation. Each student develops an individualized program of study of at least thirty hours with the guidance of an adviser. Working with a three-member committee, the student completes a comprehensive examination and a thesis.
Master of Education (M.Ed.) for Experienced Teachers

The M.Ed. for Experienced Teachers is a part-time, field-based program for teachers currently employed in local schools, public and private. The program is designed to assist licensed teachers with at least two years of experience in reflecting upon their experiences and with developing further their skill and art as professional educators. It is a 31-hour program that begins in the summer, extends through the next two years, and concludes in the third summer. Courses are offered at local sites, not on the University campus, for the convenience of practicing teachers. Courses during the school year are offered generally from 4-7 p.m.

The School of Education offers and administers the M.Ed. for Experienced Teachers program. For program information or an application please visit the school’s website at www.unc.edu/depts/ed or call (919) 966-1346.

Master of Education (M.Ed.) in Educational Psychology

Educational Psychology is a broad area of study encompassing learning and cognition, development, motivation, individual differences, and research methods (design, measurement, and statistics.) The master’s program in Educational Psychology is a thirty-hour program leading to the M.Ed. degree. The program is designed for persons desiring additional study in the areas of human development, school learning, and individual differences. Graduates of the program work in educational agencies such as public schools, state departments, and research institutes.

Prerequisites/Corequisites

Students are expected to have taken courses in child/adolescent psychology and general educational psychology. Students admitted without this knowledge are expected to register for an additional course, Psychology of Childhood and Adolescence.

Core Courses and Experiences

First Fall Semester
EDUC 182 Psychology of Learning in the School
EDUC 183 Educational Measurement and Evaluation
EDUC 184 Statistical Analysis of Educational Data
EDUC 127 Introduction of Exceptional Children

First Spring Semester
EDUC 281 Theories and Research in Human Development
EDUC 252 Instructional Theories
Electives

Second Fall Semester
EDUC 329
Electives

Second Spring Semester
Electives

In addition to the core courses, students will take one elective each in the areas of learning, development, and research methods, to be selected from a list of electives approved by the program faculty. Students will select one additional elective. In the last semester of course work, students will take a comprehensive examination administered by the program faculty. The examination will cover the areas of learning, development, exceptionality, measurement, and statistics/research methods.

Master of Education (M.Ed.) in School Counseling

The Master’s program in School Counseling is a full-time, sixty-hour program that prepares students for successful practice in the elementary, middle, and senior high schools. The program is accredited by the Council for Accreditation of Counseling and Related Educational Programs and is modeled on the four “Cs” as a conceptual base for its curriculum: counseling, consultation, coordination, and classroom guidance.

The program is firmly committed to experienced-based learning, and field experiences are a cornerstone of the curriculum. Typically, students spend two and one-half days per week for the entire school year (August - June) working in an elementary, middle, or high school. Although training usually takes place at a primary field site, students supplement and broaden their practical experience by completing work at a secondary site (typically at a different school and grade level). During the field experiences, supervision is provided weekly on an individual basis from both an on-site and a University supervisor.

Applicants to the program need to be aware of the fact that, because of the field experience requirements, students follow the calendar of the school district rather than the University’s calendar. Upon completing the School Counseling program, students are eligible for North Carolina Advanced Graduate licensure as school counselors.

Requirements

Students in the M.Ed. School Counseling program typically complete the course work in fourteen months, beginning and ending with summer study.

1. Fifty-one (51) hours of counseling courses.
2. One, three (3) hour course in life span human development (EDUC 281)
3. Six (6) hours of graduate level electives, approved by the advisor.

Semester One - Summer
First Summer Session
EDUC 205* Introduction to School Counseling 3 hours
EDUC 206 Theories of Counseling 3 hours
Second Summer Session
EDUC 208 Practicum in Counseling 3 hours
EDUC 210 Group Counseling Procedures 3 hours

Semester Two - Fall
EDUC 207 Career Development and Counseling 3 hours
EDUC 209 Tests and Measurements 3 hours
EDUC 211+ Practicum in School Counseling 9 hours
EDUC 281 Theories and Research in Human Development 3 hours

Semester Three - Spring
EDUC 212 Internship in Counseling and Consultation 9 hours
EDUC 214* Cross-Cultural Counseling 3 hours
EDUC 215* School Consultation Methods 3 hours
EDUC 216 Seminar in Applied Investigations 3 hours

Semester Four - Summer
First Summer Session
EDUC 212 Internship in Counseling and Consultation 3 hours
EDUC 213* Organizing, Guidance Services 3 hours
Second Summer Session
Elective 3 hours
Elective 3 hours

* These courses are necessary for Rehabilitation Counseling students seeking certification as a school counselor.
These students must also complete their internship experience in a public school setting.
Students must spread their internship experience during the August to June school year.
The schedule for completing these hours should be arranged with both the field supervisor and the EDUC 211 and 212 instructor.

The list below provides some examples of appropriate elective courses. It is not exhaustive. All elective courses must be graduate level (i.e., courses numbered 100 level or above at this university) and must be approved by the student’s advisor.

- EDUC 300 Educational Psychology
- EDUC 320 Child Development
- EDUC 322 Developmental Disabilities
- EDUC 323 Emotional Disturbance
- EDUC 325 Learning Disabilities
- EDUC 326 Exceptional Children
- EDUC 327 Gifted Children
- EDUC 328 English as a Second Language
- EDUC 329 Multicultural Education
- EDUC 330 Social Studies Education
- EDUC 340 Health Education
- EDUC 350 Physical Education
- EDUC 360 Nutrition Education
- EDUC 370 Family and Consumer Science
- EDUC 380 Special Education
- EDUC 390 Special Education Administration
- EDUC 400 Special Education Law
- EDUC 410 Special Education Policy
- EDUC 420 Special Education Research
- EDUC 430 Special Education Technology
- EDUC 440 Special Education Technology Applications
- EDUC 450 Special Education Technology in the Classroom
- EDUC 460 Special Education Technology in the Community
- EDUC 470 Special Education Technology in the World
- EDUC 480 Special Education Technology in the Universe
- EDUC 490 Special Education Technology in the Cosmos
- EDUC 500 Special Education Technology in the Multiverse
- EDUC 510 Special Education Technology in the Overworld
- EDUC 520 Special Education Technology in the Endworld
- EDUC 530 Special Education Technology in the Beyond
- EDUC 540 Special Education Technology in the Farther
- EDUC 550 Special Education Technology in the Distant
- EDUC 560 Special Education Technology in the Remote
- EDUC 570 Special Education Technology in the Distant
- EDUC 580 Special Education Technology in the Farther
- EDUC 590 Special Education Technology in the Distant
- EDUC 600 Special Education Technology in the Distant
- EDUC 610 Special Education Technology in the Distant
- EDUC 620 Special Education Technology in the Distant
- EDUC 630 Special Education Technology in the Distant
- EDUC 640 Special Education Technology in the Distant
- EDUC 650 Special Education Technology in the Distant
- EDUC 660 Special Education Technology in the Distant
- EDUC 670 Special Education Technology in the Distant
- EDUC 680 Special Education Technology in the Distant
- EDUC 690 Special Education Technology in the Distant
- EDUC 700 Special Education Technology in the Distant
- EDUC 710 Special Education Technology in the Distant
- EDUC 720 Special Education Technology in the Distant
- EDUC 730 Special Education Technology in the Distant
- EDUC 740 Special Education Technology in the Distant
- EDUC 750 Special Education Technology in the Distant
- EDUC 760 Special Education Technology in the Distant
- EDUC 770 Special Education Technology in the Distant
- EDUC 780 Special Education Technology in the Distant
- EDUC 790 Special Education Technology in the Distant
- EDUC 800 Special Education Technology in the Distant
- EDUC 810 Special Education Technology in the Distant
- EDUC 820 Special Education Technology in the Distant
- EDUC 830 Special Education Technology in the Distant
- EDUC 840 Special Education Technology in the Distant
- EDUC 850 Special Education Technology in the Distant
- EDUC 860 Special Education Technology in the Distant
- EDUC 870 Special Education Technology in the Distant
- EDUC 880 Special Education Technology in the Distant
- EDUC 890 Special Education Technology in the Distant
- EDUC 900 Special Education Technology in the Distant
- EDUC 910 Special Education Technology in the Distant
- EDUC 920 Special Education Technology in the Distant
- EDUC 930 Special Education Technology in the Distant
- EDUC 940 Special Education Technology in the Distant
- EDUC 950 Special Education Technology in the Distant
- EDUC 960 Special Education Technology in the Distant
- EDUC 970 Special Education Technology in the Distant
- EDUC 980 Special Education Technology in the Distant
- EDUC 990 Special Education Technology in the Distant

The list above includes some examples of appropriate elective courses. It is not exhaustive. All elective courses must be graduate level (i.e., courses numbered 100 level or above at this university) and must be approved by the student’s advisor.
From Education:
EDUC 153 Introduction to Curriculum
EDUC 171 Social Foundations of Education
EDUC 182 Psychology of Learning in the School
EDUC 127 Introduction to Exceptional Children
EDUC 311 Problems in School Counseling

From Psychology:
PSYC 127 Cognitive Development
PSYC 128 Development of Language
PSYC 129 Development of Social Behavior and Personality
PSYC 140 Advanced Personality
PSYC 144 Psychological Disorders of Childhood and Adolescence
PSYC 172 Family and Development
PSYC 183 Contemporary Sex Roles

From Social Work:
SOWO 233 Family Stress: Coping and Social Support
SOWO 234 Psychopathology
SOWO 243 Social Work Practice with Couples
SOWO 244 Approaches to Brief Treatment
SOWO 252 Substance Abuse and Dependency
SOWO 272 Services for Persons in Grief

From Communication Studies:
COMM 112 Persuasion
COMM 120 Interpersonal Communication

From Romance Languages:
SPAN 101X Elementary Spanish for Graduate Students

Master of Education (M.Ed.) and Master of Arts (M.A.) in School Psychology

The Master's program in School Psychology is a three-year plus summers, full-time program consisting of two years of course work and a one-year internship. The program covers content and skills in the professional areas of assessment, intervention, research and evaluation, consultation, and professional development. Students may elect to receive an M.A. or M.Ed. The M.A. requires a thesis. The program prepares individuals to work in schools and related educational agencies. Graduates are eligible for psychological and educational licensing in North Carolina. The School Psychology program is accredited by the National Council for Accreditation of Teacher Education and the National Association of School Psychologists.

Requirements and Prerequisites
Applicants should enter the program with course work in personality theory, abnormal psychology, statistics, learning theories, history systems, and developmental psychology. Missing prerequisites are added to the program of study.

Assessment
EDUC 221-A Psychoeducational Assessment 1.3 hours
EDUC 221-B Psychoeducational Assessment II 3 hours
EDUC 221-C Psychoeducational Assessment III 3 hours

Intervention
EDUC 222-A Behavioral Intervention I 1.3 hours
EDUC 222-B Behavioral Intervention II 3 hours
EDUC 222-C Behavioral Intervention III 3 hours

Consultation
EDUC 215-A School Consultation Methods I 3 hours

Research and Evaluation
EDUC 184 Statistical Analysis of Ed. Data I 1.3 hours
EDUC 284 Statistical Analysis of Ed. Data II 3 hours
EDUC 216 Applied Investigations 3 hours
EDUC 392 Project, Semester I (For M.Ed. students) 4 hours
EDUC 392 Project, Semester II (For M.Ed. students) 4 hours
EDUC 393 Thesis, Semester I (For M.A. students) 4 hours
EDUC 393 Thesis, Semester II (For M.A. students) 4 hours
** Only 6 hours of thesis credit can be used as part of the 60 hours for graduation.

Professional Development
EDUC 223 Professional Seminar 3 hours
EDUC 224 Internship, Semester I 3 hours
EDUC 224 Internship, Semester II 3 hours
EDUC 224 Internship, Semester III 3 hours
EDUC 224 Internship, Semester IV 3 hours
EDUC 226 Internship, Semester I 3 hours
EDUC 226 Internship, Semester II 3 hours

Psychological Foundations
EDUC 263 Neuropsychology (Biological Bases of Behavior) 3 hours
EDUC 214 Cross-Cultural Counseling (Social Aspects of Behavior) 3 hours
EDUC 222 Psychoeducational Assessment 3 hours
EDUC 222 Behavioral Intervention in Counseling and School Psychology 3 hours

Master of Arts in Teaching (M.A.T.)
The Master of Arts in Teaching (M.A.T.) program is designed for individuals wishing to teach in secondary school (grades 9-12) or in kindergarten-grade twelve special subjects. Secondary school subjects include English, Latin, mathematics, science, and social studies. Special subjects include French, German, Japanese, music, and Spanish. This school-based, student-centered program relies on partnerships between public schools and the University and uses the realities of the classroom as the motivation for students to connect theory and practice. It provides opportunities for students to accomplish three general objectives:

• expand their understanding of methodology in their content specialization;
• gain an understanding of curriculum and instruction primarily at the secondary level (but in K-12 in foreign languages and music); and
• provide knowledge of the social and psychological foundations of education.

This program is designed to prepare candidates for initial teaching licensure in North Carolina.

Several interrelated strands of knowledge run throughout the program:
• The Teaching and Methods Strand focuses upon the structure of disciplines, tools of inquiry, and methodologies concerned with instructional strategies, planning, and assessment in varied learning experiences and communities.
• The Learner and Learning Strand helps teachers design and implement learning experiences for students based on subject matter knowledge, the nature of the learning process, and the nature of learners.
• The Context Strand focuses on teacher-student-community relationships in schools and classrooms. Students will prepare case studies of each type of relationship, analyze them from cultural, historical, and pedagogical perspectives, and develop strategies to address these issues in practice.

The M.A.T. is a 12-month, full-time program that requires 39 semester hours of course work (40 if a science is taken).
Summer I (Second Session of UNC-Chapel Hill Summer School)
Introduction to Teaching (three semester hours)
Introduction to Schools (three semester hours)

Fall Semester
Learner and Learning I (three hours)
Contexts of Education I (three hours)
Fall Internship (three hours)
Methods and Materials for Teaching Secondary or K-12 Subjects I (three hours)
Section 1: English
Section 2: Foreign Languages
Section 3: Mathematics
Section 4: Music
Section 5: Science
Section 6: Social Studies
One course in the teaching field (three or four hours)

Spring Semester
Learner and Learning II (two hours)
Contexts of Education II (two hours)
Spring Internship (nine hours)
Methods and materials for Teaching Secondary or K-12 Subjects II (two hours)

Note: A portfolio of work collected throughout the year will be submitted to the faculty for evaluation at the end of the spring semester.

Summer II (First Session of UNC-Chapel Hill Summer School)
Reflecting as Teachers on Learners, Social Contexts, and Teaching Methods (three hours)

Note:
Total Hours: thirty-nine (for English, Mathematics, and Social Studies)
The science program may have forty hours, if a four-hour course is taken.
Music, English as a Second Language, and Foreign Languages will have extra hours for the required K-12 license and for the optional ESL license. For further information on these programs, contact the appropriate advisors.
Some clinical placements will include multiple settings and level of instruction.
Seminars, methods, contexts, learner, and learning courses will be ongoing over the entire twelve-month period and will be both interdisciplinary and subject area oriented.

Master of School Administration (M.S.A.)
The M.S.A. program, which develops outstanding assistant principals and principals for the schools of North Carolina and the nation, is administered by the School of Education. Please visit the website at www.unc.edu/depts/ed or call (919) 966-1354 for program information or an application.

Doctor of Education (Ed.D.) in Curriculum and Instruction
The Ed.D. program in Curriculum and Instruction is designed specifically for individuals seeking to be qualified and licensed as curriculum and instructional specialists at the doctoral level; professors of curriculum and instruction in higher education; and other positions in educational, governmental, and policy institutions.
The curriculum-instruction specialist is defined as one whose primary concern is improving learning opportunities through providing instructional leadership. The specialist is a decision maker, consultant, and adviser to administrators, teachers, and other professional personnel. Responsibilities include curriculum development, instruction, and staff development.

Applicants are admitted on the basis of their potential for outstanding contributions to education. They should hold a master’s degree in a field of education.
The Ed.D. program is administered by the School of Education. Visit the website at www.unc.edu/depts/ed or call (919) 966-1354 for program information or an application.

Doctor of Education in Counseling
At the time this document was edited, the School of Education was preparing to plan a new Ed.D. in Education with three tracks: curriculum and instruction; counseling; and educational leadership. For program information or an application visit the School of Education’s website at www.unc.edu/depts/ed or call (919) 966-1346.

Doctor of Education (Ed.D.) in Educational Leadership
The School of Education offers and administers an Ed.D. in Educational Leadership program which develops senior administrative leaders for the schools of North Carolina and the nation. The program is designed to accommodate the needs of in-residence and employed students. For program information or an application please visit the School of Education's website at www.unc.edu/depts/ed or call (919) 966-1346.

Doctor of Philosophy (Ph.D.) in Education
The schools in North Carolina and in the nation face myriad complex issues and challenges. These challenges range from meeting the educational and social-emotional needs of diverse student populations to designing, implementing, and evaluating educational programs within cultural contexts. The Ph.D. in Education prepares leaders in educational research who understand these issues and who can improve educational practice using state-of-the-art knowledge and research skills. The design of the program fosters collaboration among faculty and students from diverse disciplines.

The culture, curriculum, and change (CCC) area focuses on the study of educational change and reform through perspectives derived from curriculum studies, educational policy, and social foundations. The CCC specialty accommodates a range of individual interests including traditional curriculum disciplines, teacher education, gender studies, and cultural studies. The CCC specialty is committed to promoting educational equity.

The early childhood, family, and literacy studies (ECFL) area focuses on the study of curricular and intervention strategies that promote the development and learning of both typically developing children and children with special needs. Individual student programs of study concentrate on early childhood education, early intervention, early literacy, and the roles of cultural context and family in early development.

The educational psychology, measurement, and evaluation area focuses on the study of individuals interacting within educational contexts. Individual student programs may emphasize human learning and cognition, human development, instructional design, motivation, individual differences and exceptionality, program evaluation, and quantitative methods.
During their first semester of study, all Ph.D. in Education students enroll in a school-wide seminar, a school-wide research methods seminar, a specialty seminar, and a one-hour supervised research experience. The program requires a total of twelve credit hours of research methods - two courses required and two courses determined by each student in consultation with her/his committee. During the second, third, and fourth semesters of study, students enroll with individual faculty for one credit hour of supervised research and writing. The student and advisory committee determine the remaining courses in the 48-credit hour program.

Students in the Ph.D. program are required to maintain full-time enrollment through the completion of course work, with the expectation that they will graduate in three to four years. A master's degree is required before enrolling in the Ph.D. program.

Year One

**Fall**
- Proseminar in Education
- Fundamentals of Educational Research
- Specialty Seminar
- Supervised Research
- Elective

**Spring**
- Foundations of Research
- Supervised Research
- Elective
- Elective

Year Two

**Fall**
- Supervised Research
- Elective
- Elective
- Elective

**Spring**
- Supervised Research
- Elective
- Elective
- Elective

Years Three and Four

**Fall**
- Doctoral Dissertation

**Spring**
- Doctoral Dissertation

Note: EDUC 184 (Introductory Statistics) or its equivalent must be completed prior to admission to the program or taken during the first year of study. A minimum of six hours of dissertation credit is required.

Doctor of Philosophy (Ph.D.) in School Psychology

The doctoral program in School Psychology, fully accredited by the American Psychological Association and approved by the National Association of School Psychologists, prepares school psychologists as scientist-practitioners to assume leadership positions in academic, research, and applied settings.

Program graduates are eligible for psychological and educational licensing in North Carolina and national certification by the National Association of School Psychologists.

The doctoral program of studies is comprised of seven areas: Prerequisite Courses, Assessment, Intervention, Consultation, Research and Evaluation, Externship/Internship, and Foundations. Students are required to take courses from each of the psychological foundations.

I. Prerequisite Courses

Doctoral students in School Psychology should enter the program with coursework in personality theory, abnormal psychology, history and systems psychology, learning theories, and developmental psychology. Missing prerequisites are added to the program of study.

II. Assessment

EDUC 221-A Psychoeducational Assessment I 3 hours
EDUC 221-B Psychoeducational Assessment II 3 hours
EDUC 221-C Psychoeducational Assessment III 3 hours

III. Intervention

EDUC 222-A Behavioral Intervention I 3 hours
EDUC 222-B Behavioral Intervention II 3 hours
EDUC 222-C Behavioral Intervention III 3 hours

IV. Consultation

EDUC 215-A School Consultation Methods I 3 hours
EDUC 215-B School Consultation Methods II 3 hours

V. Research and Evaluation

EDUC 184 Statistical Analysis of Ed. Data I 3 hours
EDUC 284 Statistical Analysis of Ed. Data II 3 hours
EDUC 384 Statistical Analysis of Ed. Data III 3 hours
EDUC 216 Applied Investigations 3 hours
EDUC 211 Measurement 3 hours
EDUC 266 Policy and Program Evaluation 3 hours
or EDUC 285 or approved course
EDUC 394 Dissertation 3 hours
EDUC 394 Dissertation 3 hours

VI. Externship/Internship

EDUC 224 Externship, Semester I 3 hours
EDUC 224 Externship, Semester II 3 hours
EDUC 224 Externship, Semester III 3 hours
EDUC 224 Externship, Semester IV 3 hours
EDUC 224 Externship, Semester V 3 hours
EDUC 224 Externship, Semester VI 3 hours
EDUC 224 Externship (Optional) 3 hours
EDUC 224 Externship (Optional) 3 hours
EDUC 321 Internship, Semester I 3 hours
EDUC 321 Internship, Semester II 3 hours

VII. Foundations - Professional Standards and Ethics

EDUC 223 Professional Seminar I 3 hours
EDUC 225 Professional Seminar II 3 hours

VII. Foundations - Biological Aspects of Behavior

EDUC 263 Biological Bases of Children's Development 3 hours

VII. Foundations - Social and Cultural Aspects of Behavior

EDUC 214 Cross-Cultural Counseling 3 hours

VII. Foundations - Individual Differences in Behavior

X Covered by EDUC 221 and 222 sequences

VII. Foundations - Human Development

VII. Foundations - Cognitive/Affective

VII. Foundations - Dysfunctional Behavior/Abnormality

VIII. Electives (Not required)

Course Offerings

School of Education courses are listed under two major headings:
- CDFS Child Development and Family Studies – offered for undergraduate majors
- EDUC Courses offered for undergraduates
  - Teacher education courses for majors
  - Education courses for non majors

Course numbers are assigned as follows:
- 0 - 99 Open to undergraduates only
- 100-199 Open to advanced undergraduates and to graduate students
- 200-400 Open to graduate students only
Child Development and Family Studies

CDFS 50* EARLY CHILDHOOD DEVELOPMENT (4). Prerequisites: PSYC 10 and 24, permission of the instructor. Addresses major theories of child development across areas such as cognitive, social-emotional, physical-motor, and language. Additionally, biological, environmental, and sociocultural influences will be covered. A field-based component for students to observe and interact with socioculturally diverse young children with and without disabilities will be included. Fall, Staff.

CDFS 60* INFANT/TODDLER ASSESSMENT AND INTERVENTION (3). Prerequisites, CDFS 50, permission of the instructor. Stresses program models and curricular/intervention strategies for working with infants and toddlers. Program models and strategies for working with families will be emphasized. Spring, Staff.

CDFS 61* PRESCHOOL/Kindergarten ASSESSMENT AND TEACHING STRATEGIES (4). Prerequisites, CDFS 50 and 60, permission of the instructor. Investigates the linkage between developmental theories, assessment, and classroom practices for children ages three to five. Implementation of developmentally and culturally appropriate assessment and teaching strategies for young children with and without disabilities will be covered. Fall, Staff.

CDFS 80* INTERDISCIPLINARY SEMINAR (2). Prerequisite, permission of the instructor. Focuses on the different professional disciplines involved in the delivery of services to young children. Students will observe various professionals in their work settings interacting with young children and their families. Fall, Staff.

CDFS 81* INTERDISCIPLINARY SEMINAR (2). Prerequisite, permission of the instructor. Provides students with information regarding the variety of programs and services available for young children and their families. Spring, Staff.

CDFS 82* SENIOR INTERDISCIPLINARY SEMINAR (2). Prerequisites, CDFS 60, 80, 81, and 90, permission of the instructor. Develops skills in service coordination for families of young children. Combines the health, social, and educational needs of families of young children through interagency cooperation will be stressed. This seminar should be taken with CDFS 60 and 90 to provide a forum for discussion of recommended practices in students' infant/toddler field placements. Fall, Staff.

CDFS 83* SENIOR INTERDISCIPLINARY SEMINAR (4). Provides a forum to discuss and learn recommended practices related to preschool and kindergarten placements. This seminar should be taken with CDFS 92, Clinical Internship in Preschool and Kindergarten Programs. Spring, Staff.

CDFS 90* CLINICAL INTERNSHIP: INFANT AND TODDLER (4). Corequisites, CDFS 50 and 60, permission of the instructor. Provides a field-based internship for infants and toddlers in inclusive settings for children with and without disabilities, with periodic home visits. Fall, Staff.

CDFS 92* CLINICAL INTERNSHIP: PRESCHOOL AND KINDERGARTEN (6). Prerequisites, CDFS 50, 60, 61, and 90, permission of the instructor. Provides a supervised internship with typically and atypically developing children in preschool and kindergarten settings for forty hours per week over sixteen weeks. Spring, Staff.

CDFS 10* INTRODUCTION TO CHILD HEALTH SERVICES (3). Prerequisite, permission of the instructor. Explores topics in nutrition; healthy and safe early childhood settings; health care management of individual needs; policy/legal issues related to health care in educational/developmental settings. Fall, Staff.

CDFS 11* WORKING WITH SOCIOCULTURALLY DIVERSE FAMILIES OF YOUNG CHILDREN (3). Prerequisites, SOCI 30, permission of the instructor. Explores topics in family dynamics, cultural diversity, family-centered service delivery strategies, parent-professional relations, working with at-risk families, teaming, and family literacy. Spring, Boone.

CDFS 121* PROFESSIONAL DEVELOPMENT AND LEADERSHIP SEMINAR (4). Prerequisite, permission of the instructor. Explores topics in philosophical, historical, and legal bases for early childhood services; policy and legislation affecting early childhood services; efficacy and best practice research; ethical and professional standards. Spring, Staff.

*Open only to major in the School of Education or with permission of the director of the Professional Studies Division.

Education

EDUC 4 AESTHETICS EDUCATION: ARTS, CULTURE AND LEARNING (3). Explores techniques and tools of music, dance, drama and the visual arts to learn first-hand the value of the Arts in learning and culture. Required of all K-6 majors and must be taken in the fall of the senior year. Fall, Staff.

EDUC 12 MATHEMATICS IN ELEMENTARY EDUCATION (3). Prerequisite, one college-level math course. Provides study of the mathematics content of elementary programs, including materials, techniques, and teaching aids. Required of all K-6 majors and must be taken in the fall preceding student teaching. Fall, Fnel.

EDUC 21 INTRODUCTION TO EDUCATION (1). Provides basic introduction to teaching and education. This course is comprised of a seminar based with field placements in different levels of schools. Fall, Staff.

EDUC 22 CHILDREN IN SCHOOLS: TUTORING THE ELEMENTARY CHILD - K THROUGH 3 (1). Combines tutoring training with a field placement for tutoring in literacy and mathematics in grades K through 3. Spring, Staff.

EDUC 23* CHILDREN IN SCHOOLS: TUTORING THE OLDER CHILD - ELEMENTARY AND MIDDLE SCHOOL (1). Combines tutoring training with a field placement for tutoring in literacy and mathematics in grades 4 through 8. Spring, Staff.

EDUC 31 CAREER EXPLORATION (1). Provides students an opportunity for exploration of career choices. Fall and spring, Martin, Taylor.

EDUC 50 RISK AND RESILIENCY: CHALLENGES AND OPPORTUNITIES IN EDUCATION (4). Explores factors that put children at risk for educational failure and interventions to increase resiliency. Service and learning experiences in educational and community agencies are integral to the course. Spring, Galassi.

EDUC 51 TEACHING READING AND LANGUAGE ARTS (K-6) (4). Surveys, K-6 majors, the nature of reading and other language arts. The course is taught at an elementary school. Required of all K-6 majors and must be taken in the fall of the senior year. Fall, Cunningham, Fitzgerald, Spiegel.

EDUC 52 EMERGENT LITERACY FOR ELEMENTARY EDUCATION (1). Focuses on the development of reading and writing processes from birth through first grade, emphasizing typically developing children. Fall, Cunningham, Fitzgerald, Spiegel.

EDUC 53 LITERACY ACROSS THE CURRICULUM FOR ELEMENTARY EDUCATION (1). Provides rationale and practical methods for integrating reading and writing with content areas in the elementary school. Fall, Cunningham, Fitzgerald, Spiegel.

EDUC 58 COMMUNITY ORGANIZATIONS AND CHILDREN I (1). Provides an understanding of the community contexts of schools and an experience working in community group. This is the first semester of two-semester course. Fall, Staff.

EDUC 59 COMMUNITY ORGANIZATIONS AND CHILDREN II (1). Provides prospective teachers with an understanding of the community contexts of the schools. Second semester of a two-semester course. Prerequisite, EDUC 58. Spring, Staff.

EDUC 60 TEACHING SCIENCE IN THE ELEMENTARY SCHOOL (3). Provides methods and materials for teaching, with an emphasis on inquiry and an...
EDUC 62* STUDENT TEACHING IN ELEMENTARY GRADES (12).
Provides full-time experience in an elementary school classroom under the supervision of an experienced teacher and a University supervisor during ten or more weeks. Spring. Rogers, Wilkinson. staff.

EDUC 65* THE TEACHING PROFESSION (1.5). (Offered concurrently with EDUC 65.) Initiates students into the teaching profession. The course stresses what it is like to be a teacher, with concurrent emphasis on the life of the student and the study of schools. Prerequisite, admission to the Middle Grades Teacher Education Program. Fall. Guldledge. staff.

EDUC 66* PLANNING FOR TEACHING (4.5). (Offered concurrently with EDUC 65.) Focuses on basic skills for assessing characteristics of the student related to learning, selecting content for instruction, and planning a lesson. Prerequisite, admission to the Middle Grades Teacher Education Program. Fall. Guldledge. staff.

EDUC 68* THE ARTS AS INTEGRATIVE TEACHING (2). Explores integration of the Arts in the Curriculum. Prerequisites, admission to the Elementary Education Program or the Child Development and Family Studies Program. Fall. Hanley.

EDUC 69* TEACHING SKILLS LABORATORY (3). Prerequisites, EDUC 65 and 66. Helps students develop fundamental classroom teaching skills by assisting classroom teachers. Course is primarily a laboratory course. Spring. Staff.

EDUC 70 EXCEPTIOAL CHILDREN SEMINAR AND FIELD PLACEMENT (3). Prerequisite, admission to the Elementary Education Program. Introduces students to teaching children with special needs in the general classroom. Fall. Meece, Rogers, Snuck, Wilkinson.


EDUC 73 CULTURE, SOCIETY, AND TEACHING (6). Emphasizes the interconnection of classroom/school and society. Prerequisite, admission to the Elementary Education Program. This is a field-based course. Activities include observation and participation in a classroom and teaching social studies. Spring. Tom. staff.

EDUC 80* TRENDS AND ISSUES IN EDUCATION I (1). Explores current trends and issues in the field of education. Fall. Staff.

EDUC 81* TRENDS AND ISSUES IN EDUCATION II (1). Prerequisite, EDUC 80 or permission of the instructor. Spring. Staff.

EDUC 90* SCHOOLS, CULTURES AND COMMUNITIES I (1). Prerequisite, EDUC 80 or permission of the instructor. Spring. Staff.

EDUC 91* SCHOOLS, CULTURES AND COMMUNITIES II (1). Prerequisite, EDUC 80 or permission of the instructor. Spring. Staff.

EDUC 93H* HONORS SEMINAR IN EDUCATION (3). Prerequisite, honors candidate status in the School of Education. Integration of critical analysis of selected educational themes, introduction to methods of educational research, and intensive work in reading critically and writing skills. Required for graduation with honors in education. Spring. Unks.

EDUC 94H* HONORS THESIS IN EDUCATION (3). Prerequisite, honors candidate status in School of Education and EDUC 93H with grade of B or better. Preparation of an honors thesis under the direction of a member of the School of Education faculty, and an oral examination on the thesis. Required for graduation with honors in education. Fall and spring. Unks.

EDUC 95* TEACHING IN THE MIDDLE GRADES (6). Prerequisites, EDUC 65, 66, and 69. Focus on the organization and curriculum of the middle grades, reading and writing in the content areas, the methods of teaching in content areas, and unit planning. Fall. Friel, Jones, Guldledge. staff.

EDUC 96* TEACHING INTERNSHIP (12). (Offered concurrently with EDUC 97.) Prerequisites, EDUC 65, 66, 69, and 95. Provides the student the opportunity to plan instruction and to teach with increasing degrees of responsibility. The internship is in a school setting under the direct supervision of a classroom teacher. Spring. Staff.

EDUC 97* SEMINAR ON TEACHING (ELEMENTARY GRADES) (3). (Offered concurrently with EDUC 62.) Provides the student an opportunity to reflect on teaching and the teaching profession by integrating knowledge about teaching with observations about teaching made during the internship. Spring. Rogers, Wilkinson. staff.

EDUC 97* SEMINAR ON TEACHING (MIDDLE GRADES) (3). (Offered concurrently with EDUC 96.) Prerequisites, EDUC 65, 66, 69, and 95. Provides the student an opportunity to reflect on teaching and the teaching profession by integrating knowledge about teaching with observations about teaching made during the internship. Spring. Staff.

EDUC 100 EDUCATION WORKSHOPS (1-3). Prerequisite, permission of the director of the Professional Studies Division. Workshops designed around education topics primarily for licensed K-12 teachers. Summer. Members of the graduate faculty.

EDUC 101 OVERVIEW OF ONLINE LEARNING (3). Analyzes the concepts of online learning, explores factors influencing online learning, and examines the effectiveness of online learning. As demand warrants. Staff. (Formerly EDUC 110)

EDUC 102 ONLINE LEARNING MODELS (3). Prerequisite, EDUC 101. Examines different models for online learning and explores the theoretical basis, research, and instructional practices for online models. As demand warrants. Staff. (Formerly EDUC 120)

EDUC 103 AUDIOVISUAL INSTRUCTION; TECHNIQUES AND MATERIALS (3). Presents the techniques and methods for using the appropriate educational media and supporting resources in instructional situations. Summer. Staff. (Formerly EDUC 111)

EDUC 104 TOOLS AND TECHNIQUES: ONLINE LEARNING DESIGN (3). Prerequisites, EDUC 101, EDUC 102. Examines techniques for creating online courses following instructional design principles. Students develop interactive online learning materials using multimedia. Spring, as demand warrants. Staff. (Formerly EDUC 130)

EDUC 105 LITERATURE IN MIDDLE SCHOOL (3). Explores literature in contexts of interdisciplinary middle school curricula and the interests and needs of young adolescents. Topics include reader response theory, censorship, Internet resources, school resources, methods. Fall. Staff. (Formerly EDUC 198)

EDUC 106 PEDAGOGICAL ENGLISH GRAMMAR FOR ESL TEACHERS (3). Reviews the linguistic components of English to help educators understand potential challenges that ESL students may have in learning spoken and written English. Spring. Staff. (Formerly EDUC 107)

EDUC 107 PEDAGOGICAL LINGUISTICS FOR ESL TEACHERS (3). Provides future English as a second language teachers with advanced concepts in linguistics and comparative linguistics. Topics such as phonology and morphology will be covered. Spring. Hart, Heinig-Boynton. (Formerly EDUC 108)

EDUC 109 METHODS OF TEACHING ENGLISH AS A SECOND LANGUAGE (3). Covers teaching methods, assessment, and resource issues related to helping the ESL learner. Additional topics include theories of language learning and the relationship between culture and language. As demand warrants. Kubota. (Formerly EDCL 180)
EDUC 114 CHILDREN'S LITERATURE ONLINE (3). Approaches children's literature in a "genre and issues" manner that focuses on its applicability to elementary school children and curricula. As demand warrants. Staff.

EDUC 115G EXPLORATIONS IN LITERACY (3). Explores what it means to be a reader and writer, the nature of development of literacy. Summer. Cunningham, Fitzgerald, Spiegel.

EDUC 116 REINVENTING TEACHING (3). Addresses contexts of teaching, reaching in the world, and teaching students in schools. This course is designed for experienced educators to "reinvent teachers and teaching." Prerequisites, admission to the M.Ed. for Experienced Teachers Program. As demand warrants. Hanley, Stone. Staff.

EDUC 120A REFLECTIVE LITERACY TEACHING I (2). Prerequisite, EDUC 115G. Focuses on reflective literacy teaching: problematizing, processes of understanding students' thinking about reading and writing. Fall. Cunningham, Fitzgerald, Spiegel.

EDUC 120B REFLECTIVE LITERACY TEACHING II (1). Prerequisite, EDUC 115G. Focuses on reflective literacy teaching: problematizing, processes of understanding students' thinking about reading and writing. Spring. Cunningham, Fitzgerald, Spiegel.

EDUC 121 REVISITING REAL NUMBERS CONCEPTS (3). Uses a problem-based format and group work to explore the mathematics of the real numbers with an emphasis on rational numbers. As demand warrants. Staff.

EDUC 122 INTRODUCTION TO SCHOOL PSYCHOLOGY (3). Introduces the student to concepts and methods involved in school psychology. As demand warrants. Staff. (Formerly EDSP 120)

EDUC 125 INDEPENDENT STUDY (1-3). Prerequisite, permission of the instructor. Provides readings and research under the direction of a faculty member. May be repeated for a maximum of six credit hours. Fall, spring, and summer. Staff. (Formerly EDSP 199)

EDUC 126 CONTENT-AREA READING AND WRITING (3). Focuses on current theory, research, and issues in the teaching and use of reading and writing in the content areas. This is an introductory course. Summer. Spiegel. (Formerly EDUC 153)

EDUC 127 INTRODUCTION TO EXCEPTIONAL CHILDREN (3). Surveys giftedness and of various disabling conditions: mental retardation, emotional disturbance, learning disabilities, speech impairment, hearing impairment, vision impairment, orthopedic impairment, and neurological impairment. Fall, spring and summer. Staff. (Formerly EDSP 130)

EDUC 128 INTRODUCTION TO COMMUNICATION DISORDER (COMM 183) (3). Explores the etiology, epidemiology, assessment, and educational implications of speech and language disorders. Fall, spring and summer. Lubker. (Formerly EDSP 143)

EDUC 130 BEHAVIORAL SUPPORT TECHNIQUES (3). Emphasizes effective behavior management and applied behavior analysis techniques for intervening in the environments of exceptional children to increase learning. As demand warrants. Staff. (Formerly EDSP 179)

EDUC 131 PROGRAM DEVELOPMENT FOR SPECIAL POPULATIONS (3). Prerequisite, permission of the instructor. Reviews issues associated with program development for children who are experiencing uneven success in school because of poverty, disability, and/or intelligence. Fall. Staff. (Formerly EDSP 283)

EDUC 132 SCHOOL REFORM AND CHANGE (3). Introduces effective strategies and tactics for changing schools, varieties of school restructuring, importance of multicultural education and student-friendly school environments in site-based organizations. Fall. Schainker. (Formerly EDSP 286)

EDUC 133 SCHOOL BASED INQUIRY (3). Examines the quantitative and qualitative research methodologies appropriate to school settings; evaluates of research and its application to schools. Spring. Staff. (Formerly EDSP 292)

EDUC 134 INTERNSHIP SEMINAR ON INSTRUCTIONAL LEADERSHIP AND SUPERVISION (3). Relates internship experiences and applications about instructional design techniques of teaching/learning, evaluation of teaching/learning process, and ways in which school-based leaders can support excellence in education. Fall. K. Brown, Schainker. (Formerly EDSP 295A)

EDUC 135 INTERNSHIP SEMINAR ON SCHOOL BUILDING MANAGEMENT (3). Prerequisites: six semester hours in educational administration, including EDUC 237, and permission of the instructor. Relates internship experiences and applications of school business management practices, such as transportation, food services, plant planning, etc., to schools. Spring. K. Brown, Schainker. (Formerly EDSP 295B)

EDUC 136 PRE-INTERNSHIP SEMINAR IN EDUCATIONAL ADMINISTRATION (1). Provides opportunities to keep students linked with school practice by examining administrative services in schools. May be repeated for credit. Fall and spring. Schainker. (Formerly EDSP 368)

EDUC 137 SEMINAR AND SUPERVISED INTERNSHIP IN EDUCATIONAL ADMINISTRATION I (1-6). Provides supervised internship in school administration to facilitate the student's progress toward certification in the principalship. May be repeated for credit. Fall. Staff. (Formerly EDUC 390)

EDUC 138 SEMINAR AND SUPERVISED INTERNSHIP IN EDUCATIONAL ADMINISTRATION II (1-6). Provides supervised internship in school administration to facilitate the student's progress toward certification in the principalship. May be repeated for credit. Prerequisites, six semester hours in educational administration, including EDUC 237, and permission of the instructor. Spring. Staff. (Formerly EDUC 390)

EDUC 140 GROUP DYNAMICS, DECISION MAKING, AND PROBLEM SOLVING (3). Develops understanding and skills for working with various organizational groups. Focus is on teams, leadership of teams, team problem solving, and team decision making. Spring. Schainker. (Formerly EDU 252)

EDUC 141 INTRODUCTION TO TEACHING (3). Prerequisite, admission to the MAT program. Introduces the principles of effective teaching with emphasis of the first year of teaching. Summer. Staff. (Formerly EDUC 150)

EDUC 142 INTRODUCTION TO SCHOOLS (3). Prerequisite, admission to the MAT program. Provides an examination and overall view of schools that introduces topics such as the cultures of schools, professionalism, connections with other communities, multiculturalism, and special populations. Summer. Staff. (Formerly EDUC 151)

EDUC 143 PRACTICA IN SECOND LANGUAGES (1). Provides students an opportunity to observe and become involved with all school aspects of teaching and learning second/foreign languages. Open by permission of instructor. Fall. Heining-Boynton, Kubota. (Formerly EDUC 155)

EDUC 144 LEARNER AND LEARNING I (3). Prerequisites, EDUC 141, 142. Provides prospective teachers a conceptual understanding of child/adolescent development in order to enable them to interpret student behavior in a valid manner. Fall. Coop, Hamm. (Formerly EDUC 160)

EDUC 145 CONTEXTS OF EDUCATION I (3). Prerequisites, EDUC 141, 142. Permission of the instructor. Focuses on the social contexts of schools, conditions of teaching, relations between students, teachers, and administrators, plus equitable educational opportunity, and educational philosophies. This course is part 1 of a two-course sequence. Fall. Stone, Levine. (Formerly EDUC 161)

EDUC 146 PRACTICA STUDENT INTERNSHIP (3). Prerequisites, EDUC 141, 142. Provides students the opportunity to observe and become involved with all aspects of teaching and schools within their context area. Fall. Staff. (Formerly EDUC 165)
EDUC 147 METHODS AND MATERIALS FOR TEACHING SECONDARY K-12 SUBJECTS I (3). Prerequisites, EDUC 141, 142. Prepares students to teach the English language arts at the secondary level. The immediate purpose of this course is to prepare participants for full-time student teaching during the spring semester. Fall. Shier, Rong, Ballew, Heining-Boynton, Huff, Kubota, Vehl (formerly EDUC 170)

EDUC 148 METHODS AND MATERIALS FOR TEACHING ELEMENTARY MUSIC I (2). Prerequisites, EDUC 141, 142. Equips students with resources and experiences to facilitate entry as a specialist in the elementary music classroom. Fall. Fresne. (Formerly EDUC 175)

EDUC 150 LANGUAGE MINORITY STUDENTS: ISSUES FOR PRACTITIONERS (3). Prerequisite, open by permission of instructor. Explores issues of culture and language associated with teaching English as a second language. Fall. Kubota. (Formerly EDUC 180)

EDUC 151 PRINCIPLES OF INSTRUCTIONAL DESIGN (3). Prerequisite, EDUC 72 or related course. Studies the design and production of instructional materials incorporating goal analysis, learning task analysis, behavioral objectives, entry behavior, criterion tests, instructional strategies, design planning, and formative evaluation. Fall. Staff. (Formerly EDLC 115)

EDUC 153 INTRODUCTION TO CURRICULUM (3). Surveys the nature of curriculum development and contemporary changes as they relate to social aims, learner characteristics, and social problems. Open to graduate students in education or by permission of the instructor. As demand warrants. Fall. Tom. (Formerly EDCI 200)

EDUC 155 SEMINAR IN LEARNING DISABILITIES EDUCATION (3). Instructs students about the requirements of IDEA and case law, particularly those pertaining to learning disabilities. Students will also learn the basics of measurement concepts (reliability, validity, error, etc.). Prerequisites, EDUC 119A, EDUC 119B (may be taken concurrently with EDUC 119B, and students enrolled in the license-only program require initial competencies with regard to law and assessment that are not currently available. Fall. Bouda, Weiss (formerly EDSP 322)

EDUC 156 PROBLEMS IN SPECIAL EDUCATION (3). Prerequisite, permission of the instructor. Provides an opportunity for post-master's students who wish to engage in supervised field and pilot research. May be repeated for credit. Fall, spring, and summer. Staff. (Formerly EDSP 345)

EDUC 159 COLLABORATION WITH FAMILIES AND OTHER PROFESSIONALS (3). Instructs students about the resources available to them, their students and their students' families. Students will develop skills in working with parents and professionals as partners in the instruction and programming of programs for students with learning disabilities. As demand warrants. Bouda, Weiss. (Formerly EDSP 224)

EDUC 160 MASTERS INTERNSHIP IN LEARNING DISABILITIES EDUCATION (3). Prerequisites, EDUC 155, EDUC 119A, EDUC 119B (may be taken concurrently with EDUC 119B). Provides supervised experience in a phase of special education or literacy studies appropriate to the student's qualifications and future educational goals. Requires a minimum of three hundred clock hours at the internship site per semester. Fall, spring, and summer. Staff. (Formerly EDSP 340)

EDUC 161 ASSESSMENT AND REMEDIATION OF READING AND WRITING DIFFICULTIES (4). Prerequisite, EDSP 239 (may be taken concurrently). Focuses on diagnostic teaching of reading and writing. A decision-making model of the diagnostic process is presented as the basis for determining reading and writing strengths and weaknesses. Fall. Cunningham, Fingerlald, Spiegel. (Formerly EDSP 240)

EDUC 162 EMERGENT LITERACY (3). Focuses on the development of literacy processes (reading and writing) at the birth through first grade level. Strategies for facilitating emergent literacy are represented for typically and atypically developing children. Literacy resources and programs are explored. Spring. Fingerlald, staff. (Formerly EDUC 199)

EDUC 164 FAMILIES AND TEAMS IN EARLY CHILDHOOD INTERVENTION: INTERDISCIPLINARY PERSPECTIVES (3). Explores issues and models of family-professional and interprofessional relationships in early childhood settings. Collaborative communication and problem solving strategies are emphasized in the context of diversity. Open to graduate students only. Summer and as demand warrants. Staff. (Formerly EDUC 230)

EDUC 165 EARLY CHILDHOOD ASSESSMENT STRATEGIES (3). Provides an overview and application of strategies for developmental screenings, normative evaluations, curriculum, and play-based assessments for young children ages birth through 5. Open to graduate students only. Fall. Boone, Bole. (Formerly EDUC 231)

EDUC 166 PRESCHOOL/KINDERGARTEN CURRICULUM AND LEARNING ENVIRONMENTS (3). Focuses on individually, developmentally, and culturally appropriate learning environment and curriculum strategies for young children with and without disabilities ages 3 to 5. Open to graduate students only. Fall. Boone, Bole. (Formerly EDUC 232)

EDUC 167 INFANT/TODDLER CURRICULUM AND LEARNING ENVIRONMENT (3). Focuses on infant/toddler development and mental health strategies for facilitating development in the home and child care. Summer. Boone, staff. (Formerly EDUC 235)

EDUC 168 B-K INTERNSHIP (1-2). Provides an opportunity for students to synthesize and apply research and recommended practices in their work settings or in an assigned internship setting. Fall, Spring, Summer. Staff. (Formerly EDUC 240)

EDUC 169 CHILD DEVELOPMENT AND DISABILITY (3). Emphasizes typical development and developmental delay exhibited by children in cognitive, language, social, and affective area. Spring. Simeonson. Staff. (Formerly EDUC 242)

EDUC 171 SEMINAR IN SOCIAL FOUNDATIONS OF EDUCATION (1). Explores topics in the social and philosophical context of American public education. Spring. Staff. (Formerly EDFO 122)

EDUC 178 SEMINAR IN EDUCATIONAL STUDIES (3). Focuses on educational issues involving culture, curriculum and change. Issues addressed will vary. Fall. Staff.

EDUC 181 PSYCHOLOGY OF CHILDHOOD AND ADOLESCENCE (3). Emphasizes theories of child and adolescent development plus research findings that aid in the understanding of human behavior and development. Open only to majors in the School of Education. As demand warrants. Coop, Meec. (Formerly EDFO 101)

EDUC 182 PSYCHOLOGY OF LEARNING IN THE SCHOOL (3). Prerequisite, EDUC 72 or equivalent. Studies learning in the school setting, with emphasis on fundamental concepts, issues, evaluation of materials and experiences. Fall and spring. Struck. (Formerly EDFO 201)

EDUC 183 EDUCATIONAL MEASUREMENT AND EVALUATION (3). Identifies the basic concepts in measurement and evaluation, describes the role of evaluation in curriculum construction and revision, and describes the development and use of teacher-constructed tests. Fall. Czink. (Formerly EDFO 106)

EDUC 184 STATISTICAL ANALYSIS OF EDUCATIONAL DATA I (4). Studies descriptive and inferential statistics for educational research, including an introduction to fundamentals of research design and computer data analysis. Fall and summer. Ware. (Formerly EDFO 100)

EDUC 185 THE PSYCHOLOGY OF ADULT LEARNING (3). Focuses upon knowledge and application of learning principles and conditions for facilitating learning in adults. Fall or spring. Frierson. (Formerly EDFO 103)

EDUC 191A READING AND WRITING METHODS FOR STUDENTS WITH LEARNING DISABILITIES (4). Explores the characteristics of students with learning disabilities in the areas of reading and writing. Students will learn assessment techniques and instructional methods specific to addressing these characteristics. Fall. Weiss or Bouda. (Formerly EDSP 247)
EDUC 191B MATH AND CONTENT AREAS FOR STUDENTS WITH LEARNING DISABILITIES (4). Explores the characteristics of students with learning disabilities in math, social studies, and science. Students will also learn assessment techniques and instructional methods specific to addressing these characteristics. Spring. Weis or Boudah. (Former EDSP 247)

EDUC 193 STUDY GROUP RESEARCH I (2). Prerequisites. EDUC 116, enrollment in the M.Ed. for Experienced Teachers program. Explores the meanings of research and the potential roles of teachers in conducting research. Teachers formulate possible individual or small group research projects that they can carry out during the year. As demand warrants. Staff.

EDUC 194A ASSESSMENT AND DIFFERENTIATION (1). Prerequisites. EDUC 116, enrollment in the M.Ed. for Experienced Teachers program. Enhances teachers' understanding of how to differentiate assessment. As demand warrants. Staff.

EDUC 194B TEACHING AND DIFFERENTIATION (1). Prerequisites. enrollment in the M.Ed. for Experienced Teachers program. Enhances teachers' understanding of how to differentiate instruction. Using a case-based approach, teachers examine areas of human development, special education and inclusion, cultural diversity, linguistic diversity, cognitive styles, and multiple intelligences as frames through which to consider creative environments to promote students' classroom success. As demand warrants. Staff.

EDUC 205 INTRODUCTION TO SCHOOL COUNSELING (3). Prerequisite, graduate standing. Studies philosophical bases of pupil personnel services, with emphasis on elementary and secondary school guidance programs. Summer. D. Brown. (Formerly EDSP 206)

EDUC 206 THEORIES OF COUNSELING (3). Prerequisite, permission of the instructor. Explores current theories of counseling, with emphasis on theory as a means of conceptualizing behavior change in the counseling process. Summer. Galassi. (Formerly EDSP 201)

EDUC 207 CAREER DEVELOPMENT AND COUNSELING (3). Examines major theories of career development. The use and appraisal of student information in career counseling are major topics. Fall. D. Brown. (Formerly EDSP 202)

EDUC 208 PRE-PRACTICUM IN COUNSELING (3). Prerequisites, EDUC 201 (may be taken concurrently), permission of the instructor. Develops interviewing techniques, at specified levels of competence, through role playing and video and audio feedback. Summer. Staff. (Formerly EDSP 203)

EDUC 209 TESTS AND MEASUREMENTS (3). Prerequisite, EDUC 205. Studies basic concepts in measurement and their application in the use and interpretation of tests. The student must be required to purchase tests. Fall. Staff. (Formerly EDSP 204)

EDUC 210 GROUP COUNSELING PROCEDURES (3). Prerequisite, permission of the instructor. Applies counseling theory and research to the organization and implementation of group counseling. Fall. Staff. (Formerly EDSP 205)

EDUC 211 PRACTICUM IN SCHOOL COUNSELING (3-9). Prerequisites, EDUC 206, 208, permission of the instructor. Develops individual counseling skills and an understanding of the school as a setting for counseling through an apprenticeship experience. Fall. Galassi. Staff. (Formerly EDSP 206)

EDUC 212 INTERNSHIP IN SCHOOL COUNSELING AND CONSULTATION (3-9). Prerequisites. EDUC 206, 208, permission of the instructor. Places students in counseling and consultation under supervision in a school setting in order to develop competencies in individual counseling, group counseling, and consultation. May be repeated for credit for a maximum of twelve credit hours. Spring. D. Brown, Galassi. (Formerly EDSP 207)

EDUC 213 ISSUES IN ORGANIZING GUIDANCE SERVICES (3). Prerequisite, eighteen hours in counseling courses. Emphasizes organizing guidance services to meet such problems as those related to the special needs of women, minority groups, and the drug problem. Summer. D. Brown. (Formerly EDSP 209)

EDUC 214 CROSS-CULTURAL COUNSELING (3-6). Prerequisite, permission of the instructor. Explores the cognitive and affective considerations of counseling in culturally different social systems. This includes ways to incorporate specific sociocultural dimensions into the counseling process. Spring. Staff. (Formerly EDSP 210)

EDUC 215 SCHOOL CONSULTATION METHODS (3-12). Examines various models of consultation, the role of the consultative model in the schools and related agencies, and uses role playing and experience in the school. May be repeated for credit. Spring. D. Brown, Pryzwansky. (Formerly EDSP 223)

EDUC 216 SEMINAR IN APPLIED INVESTIGATIONS (3). Prerequisite, permission of the instructor. Provides opportunities to explore specific areas of research interest in counseling and school psychology in depth. Fall, some spring, and summer. Galassi, Waikut. (Formerly EDSP 226)

EDUC 217 PSYCHOLOGY OF CAREER DEVELOPMENT (3). Reviews the theories and research in the psychology of career development and counseling. Emphasis is on theory and implications for practice. Open to doctoral students. Fall. D. Brown. (Formerly EDSP 300)

EDUC 221 PSYCHOEDUCATIONAL ASSESSMENT (1-3). Prerequisite, permission of the instructor. Addresses knowledge and skills in techniques of observation, interviewing, assessment of environment, intelligence, achievement, perceptual motor skills, and interpersonal perceptions. May be repeated for credit. Fall and spring. Brantley, Simeonsson. (Formerly EDSP 221)

EDUC 222 BEHAVIORAL INTERVENTION IN COUNSELING AND SCHOOL PSYCHOLOGY (3). Prerequisite, permission of the instructor. Covers behavior management and therapy, and individual and group therapy. (The school psychology section includes consideration of behavioral interventions beyond those of a behavioral perspective.) May be repeated for credit. Fall and spring. Simeonsson, Waikut. (Formerly EDSP 222)

EDUC 223 SEMINAR IN PROFESSIONAL SCHOOL PSYCHOLOGY (2-3). Deals with the goals and roles of school psychology, ethical concerns, privileged information, certification and licensing, and other relevant areas. May be repeated for credit. Fall. Brantley, Pryzwansky. (Formerly EDSP 227)

EDUC 224 EXTERNSHIP IN SCHOOL PSYCHOLOGY (1-6). Prerequisite, permission of the instructor. Provides supervised observation and participation in school psychological services in schools and school-related field facilities. May be repeated for credit. Fall and spring. Brantley, Pryzwansky, Simeonsson, Waikut. (Formerly EDSP 228)

EDUC 225 DOCTORAL SEMINAR IN PROFESSIONAL SCHOOL PSYCHOLOGY (3). Prerequisites, appropriate courses and permission of the instructor. Considers advanced topics in the field of school psychology such as professional issues, standards and ethics, and interdisciplinary relations. Fall. Brantley, Pryzwansky. (Formerly EDSP 229)

EDUC 226 MASTER'S INTERNSHIP IN SCHOOL PSYCHOLOGY (1-6). Prerequisites, EDUC 224 and permission of instructor. Provides supervised full-time field experience for master's students in school psychology in a school setting. Fall, spring, summer. Pryzwansky, Brantley, Waikut. (Formerly EDSP 236)

EDUC 231 SCHOOL LAW (1-3). Prerequisites, courses required for the Class A North Carolina Teachers License and six semester hours of graduate work in school administration. Provides an overview of the legal structure of education, liability, constitutional rights, contractual relationships, federal regulations, and collective action. May be repeated for credit. Fall. F. Brown. (Formerly EDSP 298)

EDUC 232 SCHOOL GOVERNANCE (3). Prerequisite, permission of the instructor. Focuses on governance and policy at the school building level and how districtwide governance, state educational policy, federal involvement in education, and educational special interest groups impact school-sized governance. Fall, spring. Staff. (Formerly EDSP 268)
EDUC 233 PLANNING IN EDUCATIONAL ORGANIZATIONS (3).
Examines a conceptual and practical approach to planning in educational organizations. Includes a focus on environmental scanning, futures research, and strategic planning. Fall. English. (Formerly EDSP 284)

EDUC 234 THE SOCIAL CONTEXT OF EDUCATIONAL LEADERSHIP
(4). Provides a retrospective, contemporary, and prospective examination of the social, cultural, political, and philosophical contexts from which the current issues that affect schools and schooling have evolved. Fall and spring. Staff. (Formerly EDSP 287)

EDUC 235 EDUCATIONAL POLICY PROCESSES AND ANALYSIS (3).
Examines theory of competing conceptions of policy. Actors and agencies are examined at federal, state, and local levels. Interactions across levels are studied in relation to current policy alternatives. Fall. Marshall. (Formerly EDSP 288)

EDUC 236 SCHOOL MANAGEMENT (3). Prerequisites, EDUC 331, EDUC 332, permission of the instructor. Introduces tools of effective management, including conventional management systems, emerging management and instructional technology, school law, finance, personnel development, and community relations. Emphasizes management at the school level. Spring. Staff. (Formerly EDSP 289)

EDUC 237 ORGANIZATIONAL THEORY (3). Prerequisite, permission of the instructor. Analyze the theoretical assertions and empirical knowledge claims that have led to the dominant structures, power relationships, and performance expectations of American schools. Fall. Staff. (Formerly EDSP 291)

EDUC 238 MANAGEMENT IN EDUCATIONAL ORGANIZATIONS (3).
Prerequisites, EDUC 237, permission of the instructor. Examines the processes of management and their relationship to the success of the instructional programs in schools and school systems. Fall, spring. F. Brown. (Formerly EDSP 293)

EDUC 239 INSTRUCTIONAL IMPROVEMENT AND STAFF DEVELOPMENT (3). Provides fundamental knowledge of instructional design, techniques of teaching/learning, evaluation of teaching/learning process and ways in which school-based leaders can support excellence in classroom instruction. Fall and spring. Staff. (Formerly EDSP 294)

EDUC 240 SCHOOL FINANCE: ECONOMIC AND POLITICAL ISSUES
(1-3). Covers the area of financing school corporations in the current economic and political setting, with emphasis on interrelationships of educational, economic, and political decisions. May be repeated for credit. Fall, spring, summer. Staff. (Formerly EDSP 296)

EDUC 241 PRACTICUM IN ESL II/FL (3). Provides an internship to teach ESL/FL under the supervision of an experienced ESL teacher. Spring. Hearing-Byron and Kubota. (Formerly EDUC 255)

EDUC 242 LEARNER AND LEARNING II (2). Prerequisites, EDUC 144. Provides basic psychological principles upon which prospective teachers can design effective instructional programs and validly assess these programs of instruction. Spring. Coep, Hans. (Formerly EDUC 260)

EDUC 243 CONTEXTS OF EDUCATION II (2). Prerequisites, EDUC 145. Provides a weekly seminar (part two of a two-semester sequence) for interns with full-time teaching responsibilities. Interns will connect their teaching experience to social, cultural, and philosophical issues in education. Spring. Stone, Levine. (Formerly EDUC 261)

EDUC 244 PRACTICA STUDENT INTERNSHIP (9). Provides full-time internship in teaching in the content area under the supervision of experienced teachers and a university supervisor for the semester. Open by permission of instructor. Spring. Staff. (Formerly EDUC 265)

EDUC 245 METHODS AND MATERIALS FOR TEACHING SECONDARY/K-12 SUBJECTS II (2). Prerequisites, EDUC 170. Teaches intern social studies teachers be aware of trends and issues in social studies in North Carolina and the nation, therefore improving their understanding and skills in curriculum development and instruction. Spring. Rong, Trier, Malloy, Heining-Byron and Huff, Kubota, Veal. (Formerly EDUC 270)

EDUC 246 REFLECTING AS TEACHERS ON LEARNERS, SOCIAL CONTEXT, AND TEACHING METHODS (3). Prerequisite, EDUC 244. This seminar asks teachers to reflect on their experiences concerning learners and learning, social contexts of education, and teaching methods. Curriculum development and evaluation will also be explored. Summer. Staff. (Formerly EDUC 280)

EDUC 250 INDEPENDENT STUDY 200 LEVEL (1-12). Prerequisite, permission of instructor. Fall, spring, summer. Staff.

EDUC 251 CURRICULUM THEORY (3). Relates curriculum development to relevant theories and research in humanistic and behavioral studies. This is an advanced course. As demand warrants. Staff. (Formerly EDCI 209)

EDUC 252 INSTRUCTIONAL THEORIES (3). Prerequisites, a prior course on learning and permission of the instructor. Examines the nature and application of various theories of instruction to instructional goals, individual differences, teaching strategies, sequencing, motivation, and assessment. As demand warrants. Staff. (Formerly EDCI 210)

EDUC 253 INSTRUCTIONAL SYSTEMS DEVELOPMENT (3). Delineates strategies for developing instructional systems, including needs assessment, job analysis, goal setting, use of criterion tests, delivery systems, project management, and evaluation of learners and programs. As demand warrants. Staff. (Formerly EDCI 211)

EDUC 254 TEACHER EDUCATION IN THE UNITED STATES (3). Studies the research relating to teacher effectiveness and programs for the preparation of teachers. Designed for students planning to work in teacher education. As demand warrants. Tom. (Formerly EDCI 265)

EDUC 255 SUPERVISION AND INSTRUCTION (3). Examines the history, nature, and purposes of educational supervision, with an emphasis on the supervisor's role in improving teaching, curriculum development, and staff development. Spring. Day. (Formerly EDCI 294)

EDUC 256 PRINCIPLES AND METHODS IN PARENT EDUCATION AND INVOLVEMENT (3). Examines principles, theory, models, and methods for work with parents and families in educational settings, with relevant research and practical applications. As demand warrants. Staff. (Formerly EDCI 223)

EDUC 257 COLLEGE TEACHING (3). Introduces students to the planning of courses and educational programs for college students. Emphasis is on a systematic approach to developing, implementing, and evaluating instruction. This course is intended for graduate students in any academic department who plan teaching careers. As demand warrants. Staff. (Formerly EDCI 265)

EDUC 261 PROFESSIONAL DEVELOPMENT AND LEADERSHIP IN EARLY CHILDHOOD INTERVENTION (3). Prerequisites, EDUC 164, 165, and 166. Focuses on leadership skills in mentoring, supervision, staff development, resource gathering, and applied research related to early childhood settings. Spring. Boone. Staff. (Formerly EDUC 245)

EDUC 262 SPECIAL EDUCATION/EARLY CHILDHOOD INTERVENTION AND FAMILY SUPPORT (3). Explores issues, theories, models, and research relative to family-professional and inter-professional relationships in early childhood intervention. Fall. Boone. Winton. (Formerly EDSP 230)

EDUC 263 BIOLOGICAL BASES OF CHILDREN'S DEVELOPMENT (3). Focuses on the theory and research related to the biomedical and psychological aspects of exceptionality. Fall. Simonson. Staff. (Formerly EDSP 233)

EDUC 264 MULTIDISCIPLINARY APPROACHES TO EXCEPTIONALITY II (3). Focuses on the theory and research related to the sociological, legal, and educational aspects of exceptionality. Spring. Staff. (Formerly EDSP 234)
EDUC 265 CURRICULUM DEVELOPMENT IN SPECIAL EDUCATION (3). Helps the student put diagnostic and assessment procedures into practice in the classroom. Includes development of IEPs, a thorough understanding of legislative mandates directed toward special education populations, and development of evaluation techniques for accountability. As demand warrants. Swartz. (Formerly EDFO 248)

EDUC 266 PROGRAM PLANNING, POLICY ANALYSIS, AND EVALUATION OF SPECIAL POPULATIONS (3). Introduces program planning, policy analysis, and program evaluation as related to special education issues. Prerequisite, permission of the instructor. As demand warrants. Staff. (Formerly EDFO 250)

EDUC 271 EDUCATIONAL SOCIOLOGY (3). Applies sociological theory and research to problems of concern to educators. Fall. Neblit. (Formerly EDFO 223)

EDUC 272 SOCIAL CHANGE AND EDUCATION (3). Analyzes social change within a theoretical framework and describes its probable impact on education. Considers the role of the school in the development of human capital. Spring. Staff. (Formerly EDFO 224)

EDUC 274 SOCIAL AND EDUCATIONAL HISTORY OF THE UNITED STATES (3). Provides a survey of the social forces influencing the development of American education from the period of colonization to the early years of the twentieth century. Fall of odd-numbered years. Staff. (Formerly EDFO 242)

EDUC 275 FIELD TECHNIQUES IN EDUCATIONAL RESEARCH (3). Prerequisite, EDUC 184. Introduces students to field research methods and analysis of qualitative data that focuses on the application of these techniques in evaluation and policy research. Fall and spring. Marshall, Neblit, O'Sullivan. (Formerly EDFO 297)

EDUC 276 GENDER, RACE, AND CLASS ISSUES IN EDUCATION (3). Provides an understanding of and remedies for the racism, sexism, and class divisions that schools can perpetuate in curriculum, counseling, and interaction in classrooms; structure and leadership; and fundamental assumptions. As demand warrants. Staff. (Formerly EDFO 266)

EDUC 277 GENDER, POLICY AND LEADERSHIP IN EDUCATION (3). Covers feminist critiques of organizational and political power structures in readings and discussions leading to group and individual research projects. As demand warrants. Marshall. (Formerly EDSP 267)

EDUC 278 SEMINAR IN EDUCATIONAL STUDIES (3). Focuses on educational issues and theories involving culture, curriculum and change. Issues and theories addressed will vary. Fall. Staff.

EDUC 279 INTRODUCTION TO PHILOSOPHY OF EDUCATION (3). Provides a comparative study of current philosophies of education with particular attention to their impact on solutions offered to problems currently recognized in American education. As demand warrants. Stone. (Formerly EDFO 220)

EDUC 280 INTRODUCTION TO ETHICS AND EDUCATION (3). Identifies issues arising in the professional activities of education personnel in the context of systematic consideration of the nature of ethical choice. Fall, summer. Stone. (Formerly EDFO 222)

EDUC 281 THEORIES AND RESEARCH IN HUMAN DEVELOPMENT (3). Covers the basic theories and the research bases for instructional decisions. This is an advanced-level course in human development. Prerequisite, permission of the instructor. Spring, Coop, Meese. (Formerly EDFO 202)

EDUC 283 APPLIED MEASUREMENT THEORY FOR EDUCATION (3). Prerequisite, EDFO 180. An examination of the logic and theory of educational measurement. Practical applications of measurement theory to the construction and use of a variety of educational measurement devices. Spring. Staff. (Formerly EDFO 206)

EDUC 284 STATISTICAL ANALYSIS OF EDUCATIONAL DATA II (4). Prerequisite, EDUC 184 or permission of the instructor. A linear model approach to the analysis of data collected in educational settings. Topics include multiple regression, analysis of variance, and analysis of covariance, using computer packages. Spring and summer. Wace. (Formerly EDFO 280)

EDUC 285 PROGRAM EVALUATION IN EDUCATION (3). Prerequisites, EDUC 184 and 329. An examination of major approaches to program evaluation with emphasis on differences between evaluation and research. Fall and spring. Frierson. (Formerly EDFO 288)

EDUC 289 PROBLEMS IN EDUCATIONAL PSYCHOLOGY (3-5). Prerequisite, permission of the instructor. Study and development of original investigations in the area of educational psychology. Fall, spring, and summer. Staff. (Formerly EDFO 305)

EDUC 290 PROBLEMS IN EDUCATIONAL MEASUREMENT (3). Prerequisites, EDUC 184, 283, permission of the instructor. Provides an opportunity for advanced doctoral students to study a particular problem area in educational measurement under the supervision of a faculty mentor. May be repeated for credit. Fall, spring, and summer. Staff. (Formerly EDFO 303)

EDUC 294A REVISITING LITERACY (3). Prerequisite, EDUC 185G. Explores literacy topics as capstone course for Master's or licensure program in literacy; co-requisite is Restructuring Schools and Teaching. Fall. Cunningham, Fitzgerald, Spiegelt.

EDUC 300 PROSEMINAR IN EDUCATION (3). Students develop an in-depth understanding of scholarly traditions within education, histories of curricular area and current issues facing these areas and education as a whole, and application of these histories and issues to real classrooms and schools. Fall. Staff.

EDUC 301 FUNDAMENTALS OF EDUCATIONAL RESEARCH (3). Explores and analyses the range of educational research designs including experimental, correlational, survey, descriptive, case study, ethnography, narrative, policy and longitudinal research. Fall. Cizek.

EDUC 302 FOUNDATIONS OF EDUCATIONAL RESEARCH (3). Applies the philosophies of science, social science, language, and history, including recent theoretical issues, to the understanding of how educational research is conducted and what contribution is makes. Spring. Stone.

EDUC 304 SEMINAR IN CULTURE, CURRICULUM, AND CHANGE (3). Critical examination of topics and policy issues related to curriculum and educational change, considered in cultural context. Open to doctoral students. Fall. Staff.

EDUC 305 SEMINAR IN EARLY CHILDHOOD, FAMILIES, AND LITERACY (3). Critical examination of topics related to the development of young children and early literacy, and the role of families in this development. Open to doctoral students. Fall. Staff.

EDUC 306 SEMINAR IN PSYCHOLOGICAL MEASUREMENT AND EVALUATION (3). Critical examination of theoretical and research issues related to learning, development, teaching, assessment, and quantitative methods of research, from a psychological perspective. Open to doctoral students. Fall. Staff.

EDUC 307 SUPERVISED RESEARCH (1-6). Provides students with the opportunity to work with individual faculty members in collaborative research activities in association with a seminar during the second, third, and fourth quarters of study. May be repeated. Open to graduate students only. Fall, spring. Staff.

EDUC 321 DOCTORAL INTERNSHIP IN SCHOOL PSYCHOLOGY (1-6). Prerequisite, permission of the instructor. Supervised field placement experience for doctoral-level students in school psychology, integrating training with field responsibilities at a systems level in schools and school-related settings. Fall and spring. Staff. (Formerly EDSP 320)

EDUC 326 INDEPENDENT STUDY 300 LEVEL (1-12). As demand warrants. Staff.

EDUC 329 SEMINAR IN EDUCATION (3). Provides for seminar treatment of appropriate topics. Prerequisites, two courses in graduate education and permission of the instructor. As demand warrants. Staff. (Formerly EDFO 390)
EDUC 330 DOCTORAL RESEARCH SEMINAR (3). Prerequisites, two courses in graduate education and permission of the instructor. Provides an opportunity for group development and evaluation of research in a particular area of concern. Fall and spring. Staff. (Formerly EDFO 385)

EDUC 331 THE EXCELLENT SCHOOL SEMINAR (3). Research and models on high performing organizations, instructionally effective schools and school systems, and national school reform efforts presented in the context of traditional and emerging organizational theory and research. Prerequisite, permission of the instructor. Fall. Staff. (Formerly EDSP 290A)

EDUC 332 THE EXCELLENT SCHOOL SEMINAR (3). Prerequisite, permission of the instructor. Research and models on high performing organizations, instructionally effective schools and school systems, and national school reform efforts presented in the context of traditional and emerging organizational theory and research. Spring. Staff. (Formerly EDSP 290B)

EDUC 333 INTEGRATIVE SEMINAR ON MANAGEMENT APPLICATIONS, DILEMMAS, AND CONFLICTS (3). Prerequisites, EDUC 234, 235, 237, and 238. Requires students to integrate previous studies to focus on management applications, dilemmas, and conflicts. Spring. Staff. (Formerly EDSP 297)

EDUC 334 INTEGRATIVE SEMINAR ON THEORY, INQUIRY, AND ORGANIZATIONAL PRACTICE (3). Prerequisites, EDUC 234, 235, 237, and 238. Requires students to integrate previous studies to focus on theory, inquiry, and organizational practice. Spring. English.

EDUC 335 ADVANCED SEMINAR AND SUPERVISED INTERNSHIP IN EDUCATIONAL ADMINISTRATION (1-6). Prerequisites, EDUC 235, 234, 237, 238, permission of the instructor. An advanced internship and seminar relevant to the program in administration and to the student's progress toward advanced administrative certification. May be repeated for credit. Fall, spring, and summer. Staff. (Formerly EDSP 390)

EDUC 336 PROBLEMS IN EDUCATIONAL ADMINISTRATION (3 or 4). Prerequisite, permission of the instructor. Provides an opportunity for advanced students to do independent study under supervision. May be repeated for credit. Fall, spring, and summer. Staff. (Formerly EDSP 390)

EDUC 337 PROBLEMS IN SUPERVISION (3 or 4). Prerequisite, permission of the instructor. A study of major problems in the supervision of instruction, investigations of new trends, and recent research. As demand warrants. Staff. (Formerly EDSP 390)

EDUC 351 RESEARCH IN CURRICULUM AND INSTRUCTION (3). Prerequisites, EDUC 153, 184, 251, 252, 284, or permission of the instructor. Review and interpretation of existing research in the area of curriculum and instruction, including an exploration of areas of needed research. Spring. Staff. (Formerly EDCI 297)

EDUC 352 PROBLEMS IN CURRICULUM AND INSTRUCTION (3-6). Prerequisites, two courses in graduate education. May be repeated for credit. Provides an opportunity for advanced students to do independent study under supervision in an area. (Sections include early childhood, intermediate, secondary subjects, media, literacy, and general.) Fall and spring. Staff. (Formerly EDIC 303)

EDUC 353 PRACTICUM IN CURRICULUM AND INSTRUCTION (3-6). Prerequisites, permission of the instructor. A full-time field placement under the joint direction of a university staff member and a selected professional at the internship site. Fall and spring. Staff. (Formerly EDSP 341)

EDUC 371 ADVANCED QUALITATIVE ANALYSIS AND INTERPRETATION (3). This advanced seminar focuses on the needs of doctoral students immersed in qualitative research, with an emphasis on data analysis. Spring. Staff. (Formerly EDFO 298)

EDUC 372 SEMINAR IN EDUCATIONAL STUDIES (3-6). May be repeated for credit. Topics in educational philosophy to be determined by the students with the instructor. As demand warrants. Staff. (Formerly EDSP 321)

EDUC 373 PROBLEMS IN THE PHILOSOPHICAL FOUNDATIONS OF EDUCATION (3 or more). Provides an opportunity for advanced doctoral students to do independent study under supervision. Prerequisite, EDUC 279 or equivalent. As demand warrants. Staff. (Formerly EDFO 323)

EDUC 374 PROBLEMS IN THE SOCIOLOGICAL FOUNDATIONS OF EDUCATION (3 or more). Prerequisite, EDUC 271 or equivalent. Provides an opportunity for advanced doctoral students to do independent study under supervision. Fall and spring. Staff. (Formerly EDFO 324)

EDUC 375 PROBLEMS IN THE ANTHROPOLOGICAL FOUNDATIONS OF EDUCATION (3 or more). Prerequisite, permission of the instructor. Provides an opportunity for advanced doctoral students to do independent study under supervision. As demand warrants. Staff. (Formerly EDFO 325)

EDUC 376 PROBLEMS IN THE HISTORY OF EDUCATION (3 or more). Prerequisite, EDUC 274 or equivalent. Provides an opportunity for advanced doctoral students to do independent study under supervision. As demand warrants. Staff. (Formerly EDFO 326)

EDUC 378 SEMINAR IN EDUCATIONAL STUDIES (3). Involves an in-depth exploration of theories and issues involving culture, curriculum, and change. Topics will vary. As demand warrants. Staff.

EDUC 381 SEMINAR IN HUMAN DEVELOPMENT AND INDIVIDUAL DIFFERENCES (3). Prerequisite, at least one course in human development at the graduate level, or permission of the instructor. As demand warrants. Staff. (Formerly EDFO 301)

EDUC 382 SEMINAR IN HUMAN LEARNING AND COGNITION (3). Prerequisite, one or two courses in educational and developmental psychology. Studies theoretical aspects and practical implications of psychologies of learning. Fall or spring of odd-numbered years. Staff. (Formerly EDFO 302)

EDUC 384 STATISTICAL ANALYSIS OF EDUCATIONAL DATA III (3). Prerequisites, EDUC 184, 284. An extension of the general linear model to analysis of educational data with multiple dependent variables, with computer applications. Fall and summer. Staff. (Formerly EDFO 383)

EDUC 391 INDEPENDENT PROJECTS (1). Provides enrollment for students taking the master's exam but not registered for any course. Staff.

EDUC 392 MASTER'S PROJECT (3). Focuses on the development of a master's project or a major paper other than a thesis. Staff.

EDUC 393 MASTER'S THESIS (3).

DEPARTMENT OF ENGLISH

JAMES P. THOMPSON, Chair

Professors
William L. Andrews (101) African American, American
Christopher M. Armitage (1) Renaissance, Poetry
Laurence G. Avery (2) Twentieth-Century American and British, Drama, Southern, Creative Writing
A. Reid Barbour (83) Renaissance, Renaissance Studies
James W. Coleman (89) American, African American, Twentieth-Century American, Southern
Alan C. Desen (6) Renaissance, Drama
Pam Durban (114) Creative Writing
Connie C. Eble (9) English Language, Medieval
Joseph M. Flora (13) American, Twentieth-Century American and British, Southern
Darrell J. Gless (62) Renaissance
Johnny Lee Greene (57) American, African American, Twentieth-Century American, Southern
Philip Gura (78) American, American Studies
William R. Harmon (17) Twentieth-Century American and British, Poetry, Comparative Literature, Southern
Trudier Harris (60) Twentieth-Century American, African American, American, Southern, Novel, Poetry
Mae Henderson (102) African American, Twentieth-Century American, Critical Theory
Fred Holston (84) American, Southern, Twentieth-Century American, American Studies
Joy Kasson (90) American, American Studies
Edward D. Kennedy (22) Medieval, Medieval Studies, Comparative Literature, Drama
J. Kimball King (23) Twentieth-Century American and British, American, Southern, American Studies, Comparative Literature, Drama
Laurie Langbauer (97) Nineteenth-Century British, Critical Theory
George S. Lening Jr. (26) Twentieth-Century American and British, Poetry
Erika C. D. Lindeman (63) Rhetoric, Composition and Literary Studies
Charles T. Ludington Jr. (27) Twentieth-Century American, American Studies, Novel
John P. McGowan (92) Critical Theory, Nineteenth-Century British, Comparative Literature, Cultural Studies, Novel, Women's Studies
Jeanne Moskal (77) Nineteenth-Century British, Critical Theory, Women Studies
Patrick P. O'Neill (66) Medieval, English Language, Celtic, Medieval Studies
Julius R. Raper III (38) Twentieth-Century American and British, Southern
American, Novel, Creative Writing
Richard D. Ruta (42) American, American Studies, Novel, Poetry
James Seay (87) Creative Writing
Alan R. Shapiro (96) Twentieth-Century American, Creative Writing
Beverly W. Taylor (70) Nineteenth-Century British, Novel, Women's Studies
James P. Thompson (72) Eighteenth-Century British, Critical Theory, Novel
Weldon E. Thornton (48) Twentieth-Century American and British
Joseph S. Viscomi (76) Nineteenth-Century British
Linda Wagner-Martin (80) American, Twentieth-Century American, Southern, Comparative Literature, Novel, Poetry, Women's Studies
Joseph S. Wittig (51) Medieval, English Language

**Assistant Professors**
Daniel R. Anderson (104) Rhetoric, Composition and Literacy
Erin Carlson (108) Twentieth-Century American and British, Comparative Literature, Cultural Studies, Women's Studies
Tyler Carman (109) Critical Theory, Cultural Studies, Novel
Maria DeGuzman (110) Twentieth-Century American, Critical Theory
Marianne Gingher (111) Creative Writing
Thomas Reider (103) Eighteenth-Century British, Novel, Poetry
Bland Simpson (100) Creative Writing
Todd W. Taylor (105) Rhetoric, Composition and Literary Studies
Jane Thrailkill (112) American, Twentieth-Century American
Rashmi Varma (107) Twentieth-Century American and British, Critical Theory,
Comparative Literature, Cultural Studies, Women's Studies, Post-Colonial Studies
Jessica Wolfe (106) Renaissance

**Professors Emeriti**
Doris W. Betts
Charles E. Edge
Everett Emerson
Howard M. Harper Jr.
S. K. Heninger Jr.
George J. Kane
Fred H. MacInnes
William A. McQueen
Jerry L. Mills
Daniel W. Patterson
Mark L. Reed
Louis D. Rubin Jr.
H. Maxwell Sceple
Abbe D. Strauss
William S. Wells
David Whitman
Charles G. Zug III

The English Department offers work leading to the Master of Arts and Doctor of Philosophy degrees. The M.A. degree aims at mastery of scholarly techniques, comprehension of the English language, and broad knowledge of British and American literature. Building on the M.A., the Ph.D. is a more specialized degree, with a major in one of the following areas of specialization:

- English literature from the beginning to 1485
- English literature from 1485 to 1660 (including Milton)
- English literature from 1660 to 1789
- English literature from 1789 to 1900
- American literature to 1900
- American literature from 1900 to the present
- British literature from 1900 to the present
- Critical theory and cultural studies
- Rhetoric, composition, and literary studies
- African American literature
- Southern literature

Ph.D. students also focus on a minor, chosen from one of these fields just listed, or from a genre (drama, novel, poetry) or the English language, or from the following alternative minors: American Studies, Celtic, Comparative Literature, Cultural Studies, Latina/Latino Literature, Medieval Studies, Renaissance Studies, and Women's Studies. Alternatively, students may take an appropriate minor outside the department, with the approval of the director of graduate studies.
Admissions Requirements

Application for admission must be made on forms provided by the Graduate School or by the Graduate School's electronic application process. These also serve as applications for fellowships and assistantships if the applicant marks the appropriate statement on the form.

Applicants for advanced degrees must have completed an undergraduate degree, customarily with a major in English, at the time of enrollment. To be reviewed for admission by the department's Graduate Advisory Committee, applications must be supported by Graduate Record Examination scores, at least three letters of recommendation, and official transcripts showing courses, grades, and degrees awarded. A writing sample and a personal statement should also be submitted. Only applicants with an M.A. in English are eligible for admission directly into the Ph.D. program. Students who complete an M.A. in the English Department and wish to proceed into the Ph.D. Program are reviewed by the Graduate Advisory Committee for possible permission to do so. More information about the department can be obtained via its webpage: www.english.unc.edu.

Fellowships and Assistantships

Financial support for graduate students is described in the Admissions and Financial Information chapter. All applicants to the English Department are eligible to compete for University fellowships and assistantships. In addition, the department awards two types of assistantships - research assistantships and teaching fellowships. Neither is usually available in the summer. Research assistants are assigned to faculty members to help with research projects. Teaching fellows have full instructional responsibility for sections of beginning composition courses. Graduate students in the third year of the Ph.D. program who also have taught at least four sections of composition become eligible for teaching literature courses. Only persons beyond their first year of study in the M.A. program are eligible for teaching fellowships. Non-native speakers are not considered for teaching fellowships until they have been enrolled in the Ph.D. program for at least a year. The stipend for a teaching fellow is $4,400 per section, the initial assignment usually being one section a semester. A full teaching load is typically three courses per academic year. Teaching fellows are trained and supervised by the directors of composition and Undergraduate Studies and are subject to student and faculty evaluation.

The M.A. Program

Candidates for the M.A. must complete nine courses, demonstrate a reading knowledge of a foreign language, pass a written comprehensive examination, and either write a thesis (ENGL 393) or fulfill a non-thesis option (ENGL 392). The courses elected by an M.A. student must include one course in the English language, chosen from among the following: English 237 (Old English); 238 (History of the English Language); 136 (Modern English Language); 250 (Old English Literature: Beowulf, prerequisite 237); or, with permission of the director of Graduate Studies, a graduate course in linguistics, theory of language, or philosophy of language. M.A. candidates must also take Rhetorical Theory and Practice (ENGL 131); and six courses from at least four of the literary fields previously enumerated. A student must also complete three additional credit hours in any course offered within the department or in any of the fields described as alternative minors. If a minor outside the department (normally nine semester hours) is chosen, the program must be adjusted and the adjustment approved by the student's advisor and the director of Graduate Studies. Students must also satisfy residence credit requirements set by the Graduate School. Most students take one and a half years to complete the M.A. degree. With permission of the director of Graduate Studies, a regularly admitted graduate student whose native language is not English may follow a special program of studies leading to a terminal master's degree with a concentration in American literature.

The Ph.D. Program

Graduate School requirements for the doctor of philosophy degree are set forth under the heading "Graduate Degrees and Degree Requirements." A Ph.D. student must fulfill the following course requirements: two courses in the English language: ENGL 237 or 238 AND one different course chosen from among ENGL 136, 237, 238, 250, or, with permission of the director of Graduate Studies, a graduate course in linguistics, theory of language, or philosophy of language; English 131; two seminars in the major, and one seminar in the minor. In addition to course work, a candidate for the Ph.D. must pass two examinations administered by the department for which they prepare with a faculty committee a year in advance: a written examination in the major and minor, and an oral examination in the major and minor on the dissertation subject area.

Doctoral candidates must also demonstrate a reading knowledge of two foreign languages (one of which fulfilled a requirement for the M.A.). The program culminates with the candidate writing a dissertation (and registering for at least 3 semester hours of ENGL 394) and successfully defending it in an oral examination. Students must also satisfy residence credit requirements set by the Graduate School. The department strongly recommends that candidates for the Ph.D. have supervised classroom teaching experience before receiving the degree. Such experience, when it can be offered, is considered as fulfilling a requirement for the degree. Students generally take four years beyond the M.A. to complete the degree.

Foreign Language Proficiency

The English Department considers a reading knowledge of foreign languages essential to the educational and professional aims of its degree programs. M.A. candidates must show proficiency in one foreign language and Ph.D. candidates in two. The department recommends Latin, French, German, Italian, or Spanish. The use of other languages to fulfill the requirement must be approved by the director of Graduate Studies. An undergraduate major in an approved language automatically satisfies the requirement. Ordinarily, however, students fulfill the requirements by passing an examination administered through the University; by completing reading courses for graduate students offered by the Classics, German, and Romance Languages departments; or, while enrolled as a graduate student, by completing with a grade of at least B an undergraduate literature course in a foreign language. The foreign language requirement for the M.A. must be satisfied before the student can be admitted to candidacy for the Ph.D.

Library and Research Facilities

The library system at the University of North Carolina at Chapel Hill is ranked among the top twenty research libraries in the United States. It has excellent holdings for the study of English philology and British and American literature, including the Southern Historical Collection (containing manuscripts, letters, and diaries) and the Hanes Collection of incunabula, early printed books, and manuscripts. Through cooperative arrangements, university libraries in the Triangle area are open to graduate students from the University of North Carolina at Chapel Hill.
Publications

Early American Literature, Studies in Philology, The Southern Literary Journal, and a/b: Autobiography Studies are edited by English Department faculty members and have their editorial offices in the English Department building.

Courses for Graduates and Advanced Undergraduates

101X ENGLISH FOR SPEAKERS OF OTHER LANGUAGES (3). English for nonnative speakers. Emphasis on spoken or written English according to needs of students enrolled. Auditors not permitted. Fall and spring.

130 ADVANCED EXPOSITORY WRITING (3). This course strengthens the writing of graduate students and grounds them in the body of knowledge available to help them confront the writing problems most frequently faced in the worlds of thought, work, and teaching. Open to graduate students in all disciplines.

131 RHETORICAL THEORY AND PRACTICE (3). A study of rhetorical theories and practices from classical to modern times. Emphasis is on translation of theories into practice in contemporary college rhetorics.

132 HISTORY OF RHETORIC AND COMPOSITION. A history of rhetoric, beginning with classical rhetoric, but emphasizing contemporary rhetorical theory. Focuses on how language functions in society. Includes a history of composition in American higher education.

134 ADVANCED CREATIVE WRITING (3). Permission of the instructor. Advanced workshop in fiction. Written exercises in the use of scene, point of view, narration, and dialogue. Student projects in short story or beginning novel. Offered infrequently.

134S CREATIVE WRITING FOR TEACHERS (3). For students who undertake creative writing or a study of literary forms. Recommended for teachers of creative writing. Offered infrequently.

136 MODERN ENGLISH GRAMMAR (3). A study of current English structure and usage, using a traditional approach modified by appropriate contributions from structural and generative grammar, with some attention to the application of linguistics to literary analysis.

140 INTRODUCTION TO LITERARY THEORY (3). A study of various contemporary theoretical issues and critical approaches relevant to the study of literature.

142 LITERATURE AND FILM (3). An examination of several books made into films, with stress on the relationship of literature to the filmed image.

144 STUDIES IN ENGLISH LITERATURE AND THE CLASSICS (3). A study of the influences of classical literature upon selected English authors, such as Horace and Pope.

146 INTRODUCTION TO FOLKLORE (Folklore 146) (Comparative Literature 146) (Anthropology 146) (3). A survey of the primary genres (song, narrative, proverb, riddle, custom, belief, drama, game) with attention to their forms, transmission, and functions in traditional and urban societies.

147 BRITISH AND AMERICAN FOLKSONG (Folklore 147) (3).

151 ENGLISH LITERATURE OF THE MIDDLE AGES (3). A survey of Old and Middle English literature exclusive of Chaucer. Old English texts and Middle English texts with difficult language are read in translation. For nonspecialists.

153 MEDIEVAL ROMANCE (Folklore 153) (Comparative Literature 153) (3). British and continental Arthurian literature in translation from the early Middle Ages to Sir Thomas Malory.

154 SIXTEENTH-CENTURY LITERATURE, EXCLUDING DRAMA (3). A survey of major nondramatic genres and about twenty authors from the period 1485 to 1605.

160 SEVENTEENTH-CENTURY LITERATURE, EXCLUDING DRAMA (3). A survey of representative English poetry and prose from Donne to Marvell.

166 ENGLISH LITERATURE, 1660-1780 (3). A survey of English literature from Dryden to Burke. Though the emphasis falls on Swift, Pope, and Johnson, a considerable amount of reading in minor authors provides essential background for the period.

172 ROMANTIC LITERATURE (3). A survey of the major English Romantic writers, including Blake, Wordsworth, Coleridge, Shelley, Byron, and Keats, with an introduction to the chief scholarly and critical problems of this period.

174 VICTORIAN LITERATURE (3). A survey of the major Victorian writers, such as Tennyson, Browning, Arnold, Carlyle, Mill, Ruskin, Dickens, and Eliot.

179 LITERATURE OF THE AMERICAS (Comparative Literature 179) (3). Prerequisite, two years of college-level Spanish or equivalent and permission of the instructor. An examination of United States-Latin American political, social, and cultural interaction, drawing on a multidisciplined analysis of representative texts from both the United States and Latin America, selected from a variety of genres. Readings and class sections in both English and Spanish.

181 AMERICAN LITERATURE TO 1900 (3). A survey of American authors and literary trends from the seventeenth through the nineteenth centuries, with emphasis on the works of Franklin, Irving, Cooper, Poe, Emerson, Thoreau, Hawthorne, Melville, Whitman, Dickinson, Mark Twain, James, and Crane.

184 AFRO-AMERICAN FICTION AND POETRY (3). An intensive study of either fiction or poetry aimed at some comprehension of Black literature as a whole.

185 WOMEN IN FOLKLORE AND LITERATURE (Folklore 185; Women's Studies 185) (3). The images of women depicted in the folk imagination from ancient times to the present: sorcerers, conjurers, witches, sexual objects, tricksters, healers, heroines, avengers, and carriers of family tradition.

186 FOLK NARRATIVE (Folklore 186) (3). An intensive study of myths, legends, and folktales (MSilence, tall tale, animals tale, fable) with attention to their aesthetic and cultural applications.

187 FOLKLORE IN THE SOUTH (Folklore 187) (3). Exploration of folklore in the South, with emphasis on genres such as tales, Black and White spirituals, chanted sermons, work songs, blues, and dance music. Attention to social and historical backgrounds.

188 SOUTHERN AMERICAN LITERATURE (3). The literature of the South, with special attention to the Southern literature renaissance of 1930 to 1950.

189 AFRO-AMERICAN FOLKLORE (Folklore 189) (3). A study of folklore within the Black community, concentrating on African and slave backgrounds and covering rural and urban folktales, spirituals, work songs, blues, toasts, and folk beliefs.


194 LITERATURE OF THE APPALACHIAN REGION (Folklore 194) (3). Intensive analysis of a broad array of literary works from and about the Appalachian region (e.g., fiction, poetry, drama, autobiography, ballad and song, sermon), with special attention to social and cultural context.


196 IMAGES OF WAR IN TWENTIETH-CENTURY LITERATURE (Peace, War, and Defense 196) (3). A study of literary works in English concerning World War I, the Spanish Civil War, World War II, and the Vietnam War.

196A IMAGES OF WAR IN TWENTIETH-CENTURY LITERATURE: THE FIRST WORLD WAR (Peace, War, and Defense 196A) (3). A study of the responses to World War I as reflected in poems, novels, memoirs, etc., by British, American, Canadian, and Australian writers and by European writers in translation.

196B IMAGES OF WAR IN TWENTIETH-CENTURY LITERATURE: AMERICA IN VIETNAM (Peace, War, and Defense 196B) (3). A study of
American experience in the Vietnam War through its expression in personal narrative, fiction, and film.

196C LITERATURE OF WORLD WAR II (Peace, War, and Defense 196C) (3). The course focuses on novels, poetry, drama, and memoirs by writers from the major combatant nations in the war, beginning with its preliminary, the Spanish Civil War.

Courses for Graduates

201 INTRODUCTION TO MEDIEVAL STUDIES (3). An interdisciplinary course to introduce graduate students to the sources, methods, and approaches of Medieval Studies. Fall.

231 TECHNOLOGY IN THE HUMANITIES (3). A study of the influence of technology on the humanities, typically with an emphasis on teaching with computer and network technologies. Open to graduate students in all disciplines. Spring.

237A OLD ENGLISH GRAMMAR AND READINGS (3). Introduction to the prehistory of the English language through a study of the phonology, inflections, and syntax of Old English poetry. Not intended for those who will major or minor in Old and Middle English.

237B OLD ENGLISH GRAMMAR AND READINGS (3). Introduction to Old English language and literature in its historical and cultural contexts, with emphasis on the phonology, inflections, and syntax of Old English. Required of those who wish to major or minor in Old and Middle English.

238 HISTORY OF THE ENGLISH LANGUAGE (3). Prerequisite: English 237. A study of the linguistic development of the English language from 1000 to the present, with emphasis on the English language in America.

240 HISTORICAL STUDIES IN CRITICISM AND LITERARY THEORY (3). An examination of the major movements in criticism and theory, organized by historical period or topic.

241 TOPICS IN CULTURAL STUDIES (3). An interdisciplinary examination of core historical and contemporary issues in cultural studies through discussion of both textual and nontextual materials.

243 STUDIES IN THE ENGLISH NOVEL OF THE EIGHTEENTH CENTURY (3). An examination of the major novels of the eighteenth century, with emphasis on the English language in America.

244 STUDIES IN THE ENGLISH NOVEL OF THE NINETEENTH CENTURY (3). Examination of the major novelists of the nineteenth century, with emphasis on the English language in America.

250 OLD ENGLISH LITERATURE: BEOWULF (3). Prerequisite: English 237. Translation, interpretation, and background of selected Old English poetry, including Beowulf.

251A EARLY MIDDLE ENGLISH LITERATURE (3). Prerequisite, Old English. Close reading of Middle English texts before 1300. For students intending to specialize in the medieval field.

251B MIDDLE ENGLISH LITERATURE TO 1400 (3). Prerequisite, a working knowledge of Middle English. Historical and critical study of Middle English literature with particular attention to the fourteenth century.

251C LATER MIDDLE ENGLISH LITERATURE (3). A historical and critical study that includes consideration of medieval drama and the Scottish "Chaucerians.”

252 CHAUCER (3). Critical and historical study of Chaucer’s poetry.

254 STUDIES IN LITERATURE OF THE ENGLISH RENAISSANCE, EXCLUDING DRAMA (3). Selected themes and authors from the period 1485 to 1605.

255 STUDIES IN THE ENGLISH DRAMA TO 1600 (3). Major figures and forms of medieval, Tudor, and Elizabethan drama exclusive of Shakespeare.

258 STUDIES IN SHAKESPEARE: THE EARLY PLAYS (3). The romantic comedies, the history plays, and the early tragedies.

259 STUDIES IN SHAKESPEARE: THE LATE PLAYS (3). The major tragedies, the problem plays, and the romances.

260 STUDIES IN ENGLISH LITERATURE, 1600-1660 (3). Studies in English poetry from 1600 to 1660.

261 STUDIES IN ENGLISH DRAMA, 1600-1642 (3). Jacobean and Caroline drama exclusive of Shakespeare, with emphasis on Jonson, Webster, and Middleton.

264 STUDIES IN MILTON (3). A study of all of Milton’s major poetry, of selected minor poems, and of selections from the prose.

265 RESTORATION AND EIGHTEENTH-CENTURY DRAMA (3).

266 STUDIES IN ENGLISH LITERATURE, 1660-1740 (3). A study of the works of Dryden, Swift, and Pope.

267 STUDIES IN ENGLISH LITERATURE, 1740-1800 (3). A study of the major authors (exclusive of novelists and dramatists) of the late eighteenth century. Authors considered are Gray, Collins, Boswell, Johnson, Goldsmith, Burke, Reynolds, and Gibbon.

272 STUDIES IN ENGLISH LITERATURE, 1780-1832 (3). Sections: (1) Blake, Wordsworth, Coleridge; (2) Byron, Shelley, Keats. Examination of the major romantic poets, supplemented by readings in other romantic authors.

273 STUDIES IN VICTORIAN LITERATURE: PROSE (3). Examination of major Victorian critics with regard to the issues they confront and the literary structure of their works.

274 STUDIES IN VICTORIAN LITERATURE: POETRY (3). Examination of the poetry of Tennyson, Browning, and Arnold.

280 STUDIES IN AMERICAN LITERATURE (3). An introduction to the emerging genres of American literature during the colonial and early national period, with an emphasis on prose narrative.

281 STUDIES IN AMERICAN LITERATURE, 1830-1855 (3). Interpretation of selections from Emerson, Thoreau, Poe, Hawthorne, and Melville, with attention to these writers as American romantics.

282 STUDIES IN AMERICAN LITERATURE, 1855-1900 (3). A survey of American writing from 1855 to 1900, with emphasis on Whitman, Dickinson, Mark Twain, Henry James, and the local colorists.

283 STUDIES IN THE AMERICAN NOVEL (3). Historical survey of the American novel from its beginnings to the first World War, with some attention to the cultural and social conditions out of which it comes. Representative novels are read to examine the history of genres, techniques, critical schools, and modes.

284 STUDIES IN AFRO-AMERICAN LITERATURE 1750-1950 (3). A study of major trends, movements, periods, and authors in the literature of Afro-America between 1750 and 1950.


288 THE DEVELOPMENT OF LITERATURE IN THE SOUTH (3). A study of important themes, motifs, social and historical relationships, and formal problems in the literature and life of the South from colonial times onward.

290 STUDIES IN TWENTIETH-CENTURY ENGLISH AND AMERICAN LITERATURE (3). Studies in special modern literary topics, e.g., the Irish literary renaissance, politics and the modern American novel, realism and fantasy in recent American fiction, cultural influences in modern American literature.
291 STUDIES IN RECENT LITERARY AND CULTURAL THEORY (3). Usually taught as a survey of one or more major movements in contemporary literary and cultural theory.

292 STUDIES IN ENGLISH AND AMERICAN POETRY OF THE TWENTIETH CENTURY (3). Usually taught as a survey of major poets: Yeats, Frost, Stevens, Williams, Pound, Eliot, Auden, with some more recent poets.

293 STUDIES IN ENGLISH AND AMERICAN FICTION OF THE TWENTIETH CENTURY (3). Usually taught as a survey of major writers: Joyce, Lawrence, Woolf, Hemingway, Faulkner, with some other writers.

293C POSTCOLONIAL LITERATURE (3). Course focuses on literatures in English outside the Anglo-American literary traditions. Designed as a comparative study of the traditions and innovations of twentieth-century English literatures in postcolonial locations such as Africa, the Caribbean, South Asia, etc. Fall, spring.

294 STUDIES IN ANGLO-IRISH LITERATURE (3). Typical topics: Some aspects of the literary renaissance, e.g., Yeats and Joyce in their literary milieu of the late nineteenth-early twentieth-century Anglo-Irish novel. Modern Irish fiction, contemporary Anglo-Irish poetry. Fall, spring.

295 STUDIES IN ENGLISH AND AMERICAN DRAMA OF THE TWENTIETH CENTURY (3). Usually taught as a survey of major playwrights of the modern era, from the continental influences (Ibsen and Strindberg) to the contemporary figures as Pinter and Stoppard.

298 BIBLIOGRAPHY AND METHODOLOGY (3). Introduction to the materials and methods of research in literary study, including textual criticism, and to research in specific fields.

299 RESEARCH IN RHETORIC, COMPOSITION, AND LITERACY. This interdisciplinary field develops new knowledge through various research methods. The course introduces students to qualitative and quantitative studies, training them to read and conduct such research.

300 SEMINAR IN SELECTED TOPICS (1-4).

314 SEMINAR IN CULTURAL STUDIES (3). Topics vary: e.g., ethnicity and regionalism; public cultural representation; cultural Diaspora; cultural resistance, survival and revitalization; cultural nationalism; cultural policy and cultural institutions.

343 SEMINAR IN THE ENGLISH NOVEL (3). Topics concerning major novelists and critical issues in the field of the novel.

350 SEMINAR IN OLD ENGLISH LANGUAGE AND LITERATURE (3).

351 STUDIES IN MIDDLE ENGLISH LITERATURE (3). Seminars on particular authors and genres.

354 SEMINAR IN TUDOR LITERATURE (3). Selected topics in the non-dramatic literature of the English renaissance.

358 SEMINAR IN SHAKESPEARE (3). Selected topics.

360 SEMINAR IN SEVENTEENTH-CENTURY LITERATURE (3). Selected topics in the literature of the period 1600 to 1660.

366 SEMINAR IN EIGHTEENTH-CENTURY LITERATURE (3).

372 SEMINAR IN NINETEENTH-CENTURY ROMANTICISM IN ENGLAND (3). Topics concerning major authors and issues of the Romantic period.

373 SEMINAR IN VICTORIAN LITERATURE (3). Topics concerning major authors and issues of the Victorian period.

381 SEMINAR IN AMERICAN LITERATURE TO 1855 (3). Topics vary: e.g., New England response to American literary nationalism; Emerson; Hawthorne; Irving, Hawthorne, and Poe and the development of the American short story.

382 SEMINAR IN AMERICAN LITERATURE, 1855-1900 (3). Topics vary: e.g., Native American humor, Whitman, and Mark Twain.

383 SEMINAR IN THE AMERICAN NOVEL (3). Topics vary: e.g., time, space, and history in the American novel; the literary artist as American.

384 SEMINAR IN AFRO-AMERICAN LITERATURE (3).

388 SEMINAR IN SOUTHERN AMERICAN LITERATURE (3). Topics vary: e.g., Mark Twain, Southern literary identity, Southern literature of memory.

390 SEMINAR IN TWENTIETH-CENTURY LITERATURE, ENGLISH AND AMERICAN (3).

390C SEMINAR IN POSTCOLONIAL LITERATURE (3).

391 SEMINAR IN LITERARY AND CULTURAL THEORY (3). Topics vary: e.g., feminist theory, cultural materialism, new historicism, interdisciplinary examinations of the aesthetic.

392 NON-THESIS OPTION (3).

393 MASTER'S THESIS (3).

394 DOCTORAL DISSERTATION (3).

395 SEMINAR IN MODERN DRAMA (Dramatic Art 395) (3).

397 DIRECTED READINGS (3). Topics vary according to the needs and interests of the individual student and the professor directing the reading and writing project.

398 THE USE OF MIDDLE ENGLISH MANUSCRIPT MATERIALS (3). Prerequisite: a working knowledge of Middle English. Training in reading English vernacular hands of the Middle Ages, with an introduction to the theory and practice of textual criticism.

Celtic Courses

105A OLD IRISH (3). Old Irish language and literature (600-900), with the main emphasis on grammar; readings from selected Old Irish glosses (Sitranach) and from Aislinge Óengus O (Shaw).

105B OLD AND MIDDLE WELSH (3). An introduction to medieval Welsh language and literature, with selected readings from the Mabinogion and the early nature poetry. From time to time as alternative to Celtic 105A.

106A READINGS IN OLD IRISH (3). Prerequisite, Celtic 105A. Readings in genres of Old Irish literature: Stories from the Tám (Strachan), Gith Gablach (Binyeh), Cambrai Hornli, early Irish lyrics (Murphy), Scola Muicce Meic Dathó (Thurseye).

106B READINGS IN OLD AND MIDDLE WELSH (3). Prerequisite, Celtic 105B. Selected readings from medieval Welsh poetry (Cyfnfrid, Gogynfeirid, and cwydd poets), sagas (Braswen), and laws (The Laws of Hywel Dda). From time to time as alternative to Celtic 106A.

107 INTRODUCTION TO MODERN IRISH (3). A basic course in modern Irish grammar and pronunciation; background readings in Irish history and culture.

108 READINGS IN MODERN IRISH (3). Prerequisite, Celtic 107. Selected readings from various genres: the autobiography (Mo Scéal Fén, Peig, Fiche Bliain ag Fás and poetry (the ailing and caoineadh).

109 INTRODUCTION TO CELTIC CULTURE (3).

Graduate Courses for American Studies

200 INTERPRETATION OF AMERICAN CULTURE (3). Examination of problems and methods of interdisciplinary study through analysis of classic interpretations of American culture including works of intellectual history, social history, literary history, popular culture studies, regional studies. Fall and spring. Staff.

260 TOPICS IN AMERICAN STUDIES (3). Advanced study of selected interdisciplinary topics in American Studies. Subject varies with instructor. Emphasis on the practice of American culture study, with some attention to theoretical issues. Fall and spring. Staff.
299 AMERICAN STUDIES THEORY AND METHODOLOGY (3). Seminar in theoretical and methodological issues. In addition to examples of scholarly practice, students will pursue their own research interests and develop reading lists for their American Studies minor examinations. Fall and spring. Staff.

DEPARTMENT OF EXERCISE AND SPORT SCIENCE
FREDERICK O. MUELLER, Chair

Professors
John E. Billing (14) Administration, Physiology of Exercise
Anthony C. Hackney (21) Exercise Physiology, Metabolism and Endocrinology
Ronald W. Hyatt (05) Intramurals, Health Education, Administration
Robert G. McMurray (13) Physiology of Exercise
Frederick O. Mueller (07) Administration, Sports Medicine
William E. Prentice (15) Athletic Training, Sports Medicine
John M. Silva (17) Sport Psychology

Associate Professors
Kevin M. Grabiec (24) Sports Medicine, Anatomy

Assistant Professors
Bonita L. Marks (26) Exercise Physiology
Richard G. Myrank (23) Motor Control, Motor Learning, Statistics
Barbara Osborne (29) Legal Issues, Administration
Darin A. Paul (22) Anatomy, Athletic Training, Biomechanics

Adjunct Professors
John Anderson, Nutrition in Exercise
Robert Cantu, Neurosurgery
Michael T. Gross, Biomechanics
Timothy Taf, Sports Medicine

Adjunct Assistant Professors
Elizabeth Hedgecoth (30) Sports Psychology
Daniel Hooker, Sports Medicine
Donald Kirkendall, Statistics

Professors Emeriti
Patrick F. Earey
Frank Pleasants Jr.

The Department of Exercise and Sport Science offers graduate training leading to the Master of Arts degree. The Master of Arts degree provides advanced course work in the subfields of exercise and sport science. Additionally, the program provides training for research and clinical positions in a variety of fitness and rehabilitation programs in government, business, and private industry. Areas of emphasis include exercise physiology, athletic training, and sport administration.

Specialization Description

Athletic Training
The athletic training specialization is a NATA-approved program. Students gain academic and practical experience in the prevention, evaluation, management, and rehabilitation of athletic-related injuries.

Exercise Physiology
The exercise physiology specialization prepares students to pursue research careers; it also prepares them for immediate careers in the wellness industry, including private, hospital, and corporate fitness centers, as well as cardiac rehabilitation centers.

Sport Administration
The sport administration specialization prepares students for leadership positions in collegiate-level athletic administration. The intensive two-year program combines formal course work, practicum experiences, and a full-time internship in an athletic department setting.

Master of Arts
Thirty hours of graduate work are required, including a minimum of eighteen hours in exercise and sport science. EXSS 220, 225, and 393 are required of all M.A. students. Additional course requirements depend upon the specialization area. Other formal requirements for the Master of Arts include a written comprehensive examination covering the program, a formal thesis, and an oral defense of the thesis.

Ideal candidates for the program would have a foundation in exercise and sport science. This foundation can be demonstrated through coursework and field experiences in the respective specialization areas: athletic training, exercise physiology, or sport administration. Interested candidates should go to the following website for additional information: www.unc.edu/depts/exercise.

Ph.D. Study
An interdisciplinary doctoral program in human movement science is offered with the cooperative effort of the following departments at UNC-Chapel Hill: Allied Health Sciences - Division of Physical Therapy, Exercise and Sport Science, Biomedical Engineering, Physical Medicine and Rehabilitation, Orthopedics, and the Program on Aging.

This curriculum is designed to provide students an opportunity for doctoral study in areas that will increase knowledge of human movement performance. The program focuses on contributing to the scientific basis of human movement, developing theory and methods for maintaining health, preventing disability, and improving movement ability. Areas of concentration include 1) behavioral aspects of human movement, 2) biomechanics of human movement, 3) physiology of human movement, and 4) neuromuscular control of human movement.

Assistantships
The Department of Exercise and Sport Science awards a number of graduate assistantships annually to help fund students' education and provide them with practical experiences related to their area of study. Assistantships may involve any of the following activities or combinations of activities: exercise and fitness instructor, certified athletic trainer, cardiovascular rehabilitation consultant, athletic department assistant, or teaching assistant in Exercise and Sport Science. Students wishing to apply for one of these assistantships should complete and return the appropriate application form. Contact the student service assistant in the Department of Exercise and Sport Science, (919) 962-0018, for additional information.

Courses for Graduates
EXSS 110 EXERCISE TESTING AND PRESCRIPTION IN A HEALTHY POPULATION (3). Prerequisites, EXSS 76 and EXSS 89. Methods and protocols for screening, evaluating and prescribing exercise programs in apparently healthy and higher risk adult populations. Emphasis is placed on exercise testing procedures and the interpretation of the data results to promote a healthy, physically active lifestyle. Spring, Marks, McMurray.

EXSS 110L LABORATORY FOR EXERCISE TESTING (0). Available to upper level undergraduate and graduate students who have completed EXSS 76 and EXSS 89 or equivalent. EXSS 110L is a laboratory course that accompanies EXSS 110. Spring, Marks, McMurray.
220 APPLIED STATISTICS AND RESEARCH METHODS IN EXERCISE AND SPORT SCIENCE (3). A presentation of techniques used in research, with special emphasis given to planning, conducting, and reporting of research in exercise and sport science including applied statistical analysis and interpretation of data. NOTE: EXSS 220 and EXSS 225 are to be taken concurrently. EXSS 220 will emphasize basic theory and understanding of statistical analyses and research methodology. EXSS 225 will provide the opportunity for additional insight and understanding through discussion and practical experience. Spring, Shields.

225 APPLIED STATISTICS AND RESEARCH METHODS LABORATORY (3). The course is team taught, focusing on the specific research needs of each specialization within Exercise and Sport Science. Taken concurrently with EXSS 220, it integrates statistics with methodological issues through practical experiences. Guskiewicz, McMurray, Shields.

230 MANAGEMENT OF ATHLETIC INJURIES (3). Prerequisite for nonmajors, permission of the instructor. Designed to provide basic knowledge and skill that aid in the prevention and treatment of injuries common to athletics. Fall. McConnell, Guskiewicz.

232 HUMAN ANATOMY FOR ATHLETIC TRAINERS (4). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. The study of gross human anatomy with emphasis on the functional and clinical aspects of the neck, back, and extremities as related to athletic injuries. Fall. Guskiewicz.

233 PSYCHOLOGICAL CONSIDERATIONS FOR INJURY AND REHABILITATION (3). Prerequisite, graduate standing in exercise and sport science. This seminar is designed to assist graduate students in exercise and sport science to understand the psychological impact that injury and rehabilitation has on the injured athlete. Fall, spring. Hedgepath.

235 SPORTS MEDICINE ANALYSIS: SPECIAL PROBLEMS RELATED TO SPORTS MEDICINE (3). Prerequisite, permission of the instructor for nonmajors. Problem and research oriented. Spring, Prentice.

236 CLINICAL METHODS IN ATHLETIC TRAINING (3). Prerequisite, EXSS 230. Analysis of theories and techniques used in clinical sports medicine settings. Spring, Prentice.

239 PRACTICUM IN ATHLETIC TRAINING (3). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. The implementation of theories and practices in a professional setting under the direction of a competent practitioner. Spring, Prentice.

240 ADMINISTRATION OF SPORT (3). Prerequisite, instructor's permission for nonmajors. Policies and problems of organization and administration of athletic programs in colleges. Fall, Mueller.

244 LEGAL ISSUES IN COLLEGIATE SPORT (3). Provides an introduction to the United States legal system, legal principles, and legal issues related to intercollegiate athletics. Spring, Osborne.

246 ORGANIZATIONAL AND FINANCIAL MANAGEMENT OF SPORT (3). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. The study of administrative structures and financial concerns of collegiate athletic programs. An intensive study of NCAA regulations is included. Fall. Osborne.

248 COLLEGIATE SPORT MARKETING (3). Prerequisite, graduate standing. This course is designed to develop a thorough understanding of sport marketing principles and their application to collegiate athletics. Fall. Graduate faculty.

249 PRACTICUM IN SPORT ADMINISTRATION (3). Prerequisite, EXSS 240. The implementation of theory and practices in a professional setting under the direction of a competent practitioner. Spring, Osborne.

254 GROUP DYNAMICS IN SPORT (3). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. The study of the influence of teams/groups upon the individual performer within exercise and sport as well as the influence of individuals upon teams/groups. Spring. Graduate faculty.

255 SOCIAL ISSUES IN EXERCISE AND SPORT (3). A comprehensive study of race and gender discrimination, adherence, value development, violence, and other socialization factors in youth, collegiate, and Olympic sport. Spring, Hyatt.

270 MOTOR LEARNING (3). Prerequisite, EXSS 80 or permission of the instructor. A study of the physical and psychological factors that influence skill acquisition and performance in sport and exercise including applications to teaching and coaching. Fall. Graduate faculty.

276 PHYSICAL EDUCATION FOR THE DISABLED (3). Prerequisites, anatomy and physiology, or equivalents. This course is concerned with physical education for the handicapped, with emphasis on the problems of specific disabilities. Students gain actual experience in working with the handicapped. Spring. Graduate faculty.

280 PHYSIOLOGY OF EXERCISE (4). Prerequisite, graduate standing in physical education or permission of the instructor. The study of the physical, biochemical, and environmental factors that influence human performance. Emphasis is placed on metabolic, cardiovascular, respiratory, muscular, and endocrine systems. Three hours of lecture and two hours of laboratory per week. Fall. Hackney, McMurray.

281 CLINICAL EXERCISE TESTING AND PRESCRIPTION (3). Prerequisite, EXSS 110 and 110L or equivalent. This course concentrates on the knowledge and skills necessary for providing exercise testing and prescription in the clinical setting, emphasizing cardiac rehabilitation. Fall or spring. Marks, McMurray.

282 NUTRITIONAL ASPECTS OF EXERCISE (3). Prerequisite, graduate standing in physical education or permission of the instructor. Exploration of the role of macronutrients and micronutrients as they apply to exercise, physical conditioning, and competition. Students obtain experience in dietary analysis as it applies to athletic populations. Spring. McMurray.

283 ASSESSMENT OF PHYSIOLOGICAL FUNCTIONS IN EXERCISE (3). Prerequisite, EXSS 280 or equivalent, or permission of the instructor. Designed to develop laboratory techniques and experimental design skills as applied to the physiology of human performance. Spring. Hackney, McMurray.

285 SEMINAR IN EXERCISE PHYSIOLOGY (3). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. In-depth study of selected advanced topics in exercise physiology. Emphasis on metabolism, biochemical, and cardiopulmonary physiology with student presentations on selected topics. Fall. Hackney, McMurray.

289 PRACTICUM IN EXERCISE PHYSIOLOGY (3). Prerequisites, EXSS 280 and EXSS 110, 110L or EXSS 281 or permission of the instructor. The implementation of theories and practices of fitness or cardiac rehabilitation in a professional setting under the direction of an experienced practitioner. Fall and spring. McMurray, Hackney, Marks.

300 SPECIAL TOPICS IN EXERCISE AND SPORT SCIENCE (1-3). Prerequisite, graduate standing or permission of the instructor. The study of special topics directed by an authority in the field. Fall and spring. Graduate faculty.

320 RESEARCH IN EXERCISE AND SPORT SCIENCE (1-3). Prerequisite, graduate standing in exercise and sport science or permission of the instructor. Individually designed research projects conducted by students under the direction of a graduate faculty member. Fall and spring. Graduate faculty.

393 MASTER'S THESIS (3-6). Fall, spring, and summer. Graduate faculty.

CURRICULUM IN FOLKLORE
GLENN HINSON, Chair

Professors
Carole L. Crumley (22) Archaeology, Complex Societies, Europe
Kaja Finkler (21) Medical Anthropology, Latin America
Jacquelynn Hall (18) American History, Southern Oral History
*Trodier Harris (5) African American Folklore and Literature
Norris B. Johnson (21) Cultural Anthropology, Art and Literature
Edward Donald Kennedy (6) Medieval Romances, Arthurian Literature
H. Craig Melcher (23) Indo-European Linguistics
Patrick P. O'Neill (20) Medieval Literature, Celtic Languages and Culture
James Lowe Peacock (10) Culture Change, Symbolic Systems, Southeast Asia
Jack M. Sasson (17) Ancient Near East
Ruel W. Tyson Jr. (15) Philosophy and Anthropology of Religion

**Associate Professors**
Robert Edward Daniels (2) Social Anthropology, Culture and Personality, Africa
John W. Florin (16) Population Geography, Medical Geography, and Historical Anglo-America
Della Pollock (9) Performance of Literature, Performance Theory and Criticism, Cultural Studies

**Assistant Professors**
*Patricia E. Sawin (1) Feminist Theory, Ethnography of Speaking, Performance, Southwest Louisiana

**Professors Emeriti**
Daniel W. Patterson
Charles Gordon Zug
* core faculty

The Curriculum in Folklore focuses on the study of creativity and aesthetic expression in everyday life, and on the social and political implications of this expression as it unfolds in the contested arenas of culture. Not bound to traditional definitions of folklore, and committed to preparing students for ethical practice in a multicultural world, the curriculum offers a flexible M.A. program that readies students for both public practice and further academic study.

The millennium’s turn marked five decades of the curriculum’s presence at UNC-Chapel Hill. Founded with an eye to regional study, and deeply integrated with the University’s long-standing focus on Southern history, literature, and culture, the curriculum maintains its commitment to the study of regional folk life. This commitment, however, in no way limits the curriculum’s vision. Though students and faculty still do much of their fieldwork in the South, they are just as likely to be working with poets in Chicago, shamans in Siberia, or sci-fi costumers in Boston. Faculty interests tend to cluster within the areas of music, language and narrative, African American culture, public folklore, gender, material culture, occupational folklore, and the politics of culture. Deeply committed to collaborative work in the public realm, curriculum members work extensively with local communities, pursuing projects with museums, arts councils, media production companies, and a range of other organizations.

Structurally, the curriculum is an interdisciplinary program. Faculty are housed in various home departments (American Studies, Anthropology, English, Geography, History, Linguistics, and Religious Studies). The core faculty each hold a half-time appointment in Folklore (although most of their courses in other departments are also relevant to folklore study).

The University of North Carolina offers a fitting home for the Curriculum in Folklore. Its libraries have extensive holdings of books, manuscripts, periodicals, images, and sound recordings relating to folklore. Holdings of folklore materials are especially strong for the American South and the British Isles. Particularly notable among these collections are the Archie Green Occupational Folklife Collection, the Don Yoder Collection of American religious tune books, the John Edwards Memorial Collection of early Southern commercially recorded folk and popular music, and the Southern Folklife Collection of field and commercial recordings.

Degree Requirements: The M.A. program in Folklore stresses flexibility, inviting students to craft a course plan to meet their particular needs. Master’s students must complete ten courses (thirty hours); of these, only two — Introduction to Folklore Theory (FOLK 296) and The Art of Ethnography (FOLK 297) — are required. Other courses must demonstrate a rough balance between genre, theory, area studies, and practice. In addition to classes in the core curriculum, students traditionally take courses from a variety of associated graduate programs, including Anthropology, Communications Studies, English, History, and Music. Students pursuing an M.A. must demonstrate reading proficiency in a foreign language.

Students may also opt for a Folklore minor in another Ph.D. program. Students pursuing the minor must complete only six courses.

For full descriptions of courses listed below only by title, see the listings under those courses’ home departments.

**Courses for Graduates and Advanced Undergraduates**

106 CELTIC READINGS IN OLD IRISH (LING 106) (3). O’Neill.

109 INTRODUCTION TO CELTIC CULTURE (CELT 109) (3). O’Neill.

121 CULTURE AND PERSONALITY (ANTH 121) (3). Spring. Daniels.

123 MAGIC, RITUAL, AND BELIEF (ANTH 123) (3). Spring. Evens.


130 AMERICAN INDIAN SOCIETIES (ANTH 130) (3). Spring. Staff.

132 LATIN AMERICAN CULTURES (ANTH 132) (3). Fall. Finardi, de la Cadena.

133 THE PEOPLE OF THE CARIBBEAN (ANTH 133) (3). Fall. Slocum.


135 CONSCIOUSNESS AND SYMBOLS (ANTH 135, CMPL 135) (3). Fall. Peacock.


142 RELIGION AND ANTHROPOLOGY (RELI 142) (3). Fall. Peacock and Tyson.

143 INDO-EUROPEAN CULTURE AND SOCIETY (LING 142) (3). Fall. Melcher.

146 INTRODUCTION TO FOLKLORE (ANTH 146, CMPL 146, ENGL 146) (ANTH 146) (3). A survey of the primary genres (song, narrative, proverb, riddle, custom, belief, drama, game) with attention to their forms, transmission, and functions in traditional and urban societies. Fall.

147 BRITISH AND AMERICAN FOLKSONG (ENGL 147) (3). Fall.

148 TRADITIONAL CRAFTSMANSHIP (3). This course introduces students to material folk culture, the study of the origins and transmission, forms and construction, and functions and meanings of traditional architecture, arts, crafts, food, clothing, tools, and technology. Spring.

153 MEDIEVAL ROMANCE (ENGL 153) (3). Fall. Kennedy.

154 HISTORICAL GEOGRAPHY OF THE UNITED STATES (GEOG 154) (3). Florin.

155 ETHNOHISTORY (ANTH 155) (3). Integration of data from ethnographic and archaeological research with pertinent historical information. Familiarization
with a wide range of sources of ethnohistorical data and practice in obtaining and evaluating information. Persistent theoretical concepts are explored. (Alternate years.) Fall. Crumley.

161 ORAL HISTORY AND PERFORMANCE (COMM 161, HIST 173, WMST 173) (3). This course combines readings and field work in oral history with study of performance as a means of interpreting and conveying oral history texts. Emphasis on women's history. Fall and spring.

165 RITUAL, THEATRE, AND PERFORMANCE IN EVERYDAY LIFE (COMM 165) (3). This course explores the dynamics of performance as it is broadly produced within the texture of individual experiences, the interaction of community memberships, and the dramas of cultural aesthetics. Fall, spring.


174 INTRODUCTION TO ORAL HISTORY (HIST 170) (3). Introduces students to the use of interviews in historical research. Questions of ethics, interpretation, and the construction of memory will be explored, and interviewing skills will be developed through field work. Fall. Hall.

175 ETHNOGRAPHIC METHOD (ANTH 175) (3).

184 LANGUAGE AND CULTURE (ANTH 184) (3). Anthropological study of language as a pivotal mediator of humans' mental, social, and cultural lives; the constitution of social relations through speech and social symbolism of speech styles. Fall. Sawin.

185 WOMEN IN FOLKLORE AND LITERATURE (ENGL 185) (3).

186 FOLK NARRATIVE (ENGL 186) (3). An intensive study of myths, legends, and folktales (mSrshen, tall tale, animal tale, fable) with attention to their aesthetic and cultural applications. (Alternate years.) Spring.

187 FOLKLORE IN THE SOUTH (ENGL 187) (3).

188 COUNTRY MUSIC AND AMERICAN SOCIETY (3).

189 AFRICAN AMERICAN FOLKLORE (ENGL 189) (3). A study of folklore within the black community, concentrating on African and slave backgrounds, and covering rural and urban folktales, spirituals, work songs, blues, toasts, and folk beliefs. Fall. Harris.

190 VERNECULAR TRADITIONS IN AFRICAN AMERICAN MUSIC (AFAM 180) (3). Explores performance traditions in African American music, tracing the music's development from African song through blues, jazz, gospel, and contemporary vernacular expression. Focuses on continuity, creativity, and change within African American aesthetics. (Alternate years.) Fall. Hinson.

193 THE POLITICS OF CULTURE (3).

195 TOPICS IN FOLKLORE (3). Fall and spring. Staff.

198 FIELD RESEARCH (3). Fall and spring. Staff.

199 DIRECTED READINGS IN FOLKLORE (3). Fall and spring. Staff.

Courses for Graduates

241 PERFORMANCE ETHNOGRAPHY (COMM 241) (3).

266 OCCUPATIONAL HISTORY AND FOLKLORE (HIST 266) (3). This course explores worker culture through a combination of social/labor history, literature, and folklore/anthropological analysis. Selected themes range from classic sites of laborlore through less-studied expressions from new workplaces. Fink.


290 PUBLIC FOLKLORE (3). A graduate seminar addressing theory and praxis in public sector cultural work. Focusing on public folklore, this course explores broad issues of representation, cultural politics, and cultural tourism. (Alternate years.) Fall. Hinson.

295 STUDIES IN FOLKLORE (3). Fall and spring. Staff.

296 APPROACHES TO FOLKLORE THEORY (3). A systematic overview of the major issues and perspectives informing two centuries of folklore study, including: social base, tradition, evolution, diffusion, structure, function, interpretation, performance, feminism, ideology. Fall. Sawin.

297 ART OF ETHNOGRAPHY (ANTH 297) (3). A field-based exploration of the pragmatic, ethical, and theoretical dimensions of ethnographic research, addressing issues of experience, aesthetics, authority, and worldview through the lens of cultural encounter. Field research is required. Spring. Hinson.

393 MASTER'S THESIS (3-6). Research in a special field under the direction of staff members. Fall and spring.

395 RESEARCH. Fall and spring. Staff.

CURRICULUM IN GENETICS AND MOLECULAR BIOLOGY

SUSAN T. LORD, Director

Professors
Steven L. Bachenheimer (30) Alterations to Cell-Cycle and Signal Transduction Pathways Following Herpes Simplex Virus Infection
Albert S. Baldwin (79) Regulation of Gene Expression; Control of Oncogenesis and Apoptosis
Kerry S. Bloom (45) Mechanisms of Chromosome Segregation in Yeast; Chromosome and Spindle Dynamics
David A. Brenner (100) Regulation of Gene Transcription; Hepatic Fibrogenesis; Porphyrins
Jaane G. Cannon (46) Molecular Biology of Bacterial Pathogens
Stephen G. Chantry (105) DNA Repair, Drug Resistance, Cancer Chemotherapy, Mutagenesis
Stephen H. Clarke (82) Molecular Immunology; B-Cell Differentiation and Tolerance; Autoimmunity
Stephen T. Crews (61) Molecular Genetics of Nervous System Development in Drosophila; Gene Regulation
Jeffrey L. Dansh (106) Plant Genetics and Cellular Biology, Plant Disease Resistance and Cell-Death Control
Channing J. Der (88) Oncogenesis: ras Superfamily Proteins; Signal Transduction
Marshall H. Edgell (4) Molecular Genetics; Transposon Evolution and Biochemistry; Protein Engineering
Beverly J. Errede (44) Yeast Molecular Genetics; MAP-Kinase Activation Pathways; Regulation of Cell Differentiation
Resana A. Farber (71) Cancer Genetics; Human Molecular Genetics; Somatic-Cell Genetics; Microsatellite Instability
Jeffrey A. Frelinger (49) Molecular Immunogenetics, Function of Major Histocompatibility Complex in Virus Infection
Jack Griffin (35) HIV, Transcription; Electron Microscopy
Eng Shang Huang (52) Pathobiology and Genetics of Human CMV
Clyde A. Hutchison III (10) Molecular Genetics, Genomics; Transposable Elements, Directed Mutagenesis
Alan M. Jones (114) Signal Perception; Regulation of Growth and Development; Programmed Cell Death
Ryszard Kole (64) RNA Processing, RNA-Protein Interactions; Anti-sense Oligonucleotides as Chemotherapeutic Agents
Assistant Professors

Shawn Ahmed (125) Lifespan, Telomeres, and the DNA Damage Checkpoint
Miriam Beausire (126) Protein Secretion and the Pathogenesis of Mycobacterium Tuberculosis
Frank Conlon (127) Molecular Basis of Congenital Heart Disease
Adrienne Cox (116) Ras Family Oncogenes and Signaling, Cellular Radiation Response, Lipid Modification and Drug Development
Blossom Damania (128) Functional Analysis of K1 Viral Oncogene of Kaposi’s Sarcoma-Associated Herpesvirus
Robert J. Duronio (57) Genes of Cell Cycle Control During Drosophila Development
Bob Goldstein (120) Generation of Cell Diversity in Early Development of C. elegans
Sarah R. Grant (107) Genetics of Sex Determination in Flowering Plants
Fernando Pardo-Mancio de Villena (129) Transmission Genetics, Non-Mendelian Inheritance, and Chromosome Segregation During Female Meiosis
Charles Perou (130) Molecular Characterization and Classification of Human Breast Tumors Using Genome-Wide Expression Patterns
Dale Rammensee (118) V(DJ) Recombination; DNA Double Strand Break Repair
Jeff Se bekely (119) Mitotic Recombination; DNA Repair
David Snowdell (124) Modifiers of the Ehrlich Gene Family, Colorectal Cancer Susceptibility Genes
Christopher E. Walsh (111) Genetic Correction of Inherited Hematopoietic Stem Cell Disease, Stem Cell Biology
Wendell Yarbrough (132) ARF and Head and Neck Cancer
Yi Zhang (121) Chromatin Dynamics, Gene Expression, Cancer

Adjunct Associate Professors

Michael A. Reznick (40) Roles of Various DNA Repair in Meiosis
Roger W. Witten (110) Breast-Ovarian Cancer Susceptibility, Molecular Genetics

Professors Emeriti

John B. Graham
William S. Pollitzer
Maureen Whitinghill

The Curriculum in Genetics and Molecular Biology is an interdisciplinary predoctoral training program leading to a Ph.D. degree in Genetics and Molecular Biology. The goal of this program is to train students to be creative, sophisticated research scientists within the disciplines of genetics and molecular biology. To this end we emphasize acquisition of a foundation of knowledge, accumulation of the laboratory skills required for implementing research objectives, and development of the ability to formulate experimental approaches to solving contemporary problems in the biological sciences. During their first year, students enroll in graduate-level courses and participate in laboratory rotations. Subsequently, students select a faculty research advisor and establish an advisory committee. Research work is done in the laboratory facilities of the individual faculty member and is supported primarily by faculty research grants.

The curriculum faculty have appointments in twelve departments in the School of Medicine and the College of Arts and Sciences. The faculty represent diverse research interests and are particularly strong in the areas of molecular genetics, genetic selection, genetic complementation, and gene targeting to approach questions regarding regulation of gene expression and control of cellular processes. Students are able to choose from a variety of biological systems and questions for their thesis research.

Requirements for Admission for Graduate Work

Applications from students with good academic records and interest in research careers in genetics and molecular biology are favorably considered. Applicants preferably have majored or minored in one of the following disciplines: genetics, biology (zoology or botany), microbiology, chemistry, mathematics, physics, or biophysics. They usually have taken calculus and
organic and physical chemistry although these are not essential. Applicants are accepted to begin their initial studies in the fall. They must apply to both the Graduate School and the Curriculum in Genetics and Molecular Biology. Graduate Record Examination scores, transcripts of records, three letters of recommendation (submitted on the Graduate School official form) and a genetics application form should be received with the application. Those whose application portfolio places them higher on the admission list are asked to visit Chapel Hill for interviews. Students are encouraged to apply as early as possible, preferably before January 1. (Applicants seeking a master's degree are not considered for admission.)

Requirements for the Ph.D. Degree

In addition to the dissertation requirements of the Graduate School (four full semesters of credit including at least six hours of GNET 394, Doctoral Dissertation; a written preliminary examination; an oral examination; and a dissertation), curriculum students are required to take GNET 110, 111, 112 (BIOL 161, Principles of Genetic Analysis), and one seminar course in which at least one-third of the final grade is based upon class participation, as a teaching assistant for one semester, participate in GNET 275 (a student seminar series) as an attendee in the first and second years and as a presenter in the later years, participate in the curriculum's retreat, and attend the weekly seminar series sponsored by the curriculum. Students are required to rotate through at least two laboratories before choosing a thesis adviser. It is strongly recommended that students attend national meetings in order to understand better how their research fits with progress in their field.

Financial Aid

Stipends for predoctoral students are available from an NIH predoctoral training grant and the University.

Courses for Graduates and Advanced Undergraduates

105 MOLECULAR BIOLOGY (Biochemistry 105) (3). Prerequisite, Biochemistry 100 or equivalent. Mechanisms of replication, transcription, and translation of genetic material in prokaryotic and eukaryotic systems. DNA sequence and organization, biochemical genetics, and regulatory mechanisms. Three lecture hours a week. Fall. Crews, Van Dyke, Xiong, Marsluff.

110 ADVANCED MOLECULAR BIOLOGY I (Biochemistry 110, Microbiology 108, Pharmacology 136, Biology 178) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics. DNA structure, function, and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair, and genome fluidity. Three lecture hours a week. Fall. Mason, Griffith, Sancar.

111 ADVANCED MOLECULAR BIOLOGY II (Biochemistry 111, Microbiology 109, Pharmacology 137, Biology 179) (3). Prerequisites for undergraduates, at least one undergraduate course in both biochemistry and genetics. RNA structure, function, and processing in biological systems including transcription, gene regulation, translation, and oncogenes. Three lecture hours a week. Spring. Baldwin, Marsluff.

112 PRINCIPLES OF GENETIC ANALYSIS 1 (Biology 161) (4). Prerequisite for undergraduates, Biology 50; for graduate students, an undergraduate genetics course or permission of instructor. Genetic principles of genetic analysis in prokaryotes and lower eukaryotes. Peters, Pringle. Spring. Peters, Pringle.

113 PRINCIPLES OF GENETIC ANALYSIS 2 (Biology 162) (4). Prerequisite, Genetic Analysis 1. Principles of genetic analysis in higher eukaryotes; genomics. Staff.

122 HUMAN GENETICS (Biology 122) (3). Prerequisite, Biology 50. Pedigree analysis, inheritance of complex traits, DNA damage and repair, human genome organization, DNA fingerprinting, the genes of hereditary diseases, chromosomal aberrations, cancer and oncogenes, immunogenetics, and tissue transplants. Three lecture hours a week. Spring. Maroni.

125 CLINICAL AND COUNSELING ASPECTS OF HUMAN GENETICS (Biology 125) (3). Prerequisites, Biology 122 or Genetics 174 and permission of instructor. Topics in clinical genetics including pedigree analysis, counseling/ethical issues, genetic testing, screening, and issues in human research taught in a small group format. Active student participation if expected. Spring. Roche.

150 ELEMENTS OF PROBABILITY AND STATISTICAL INFERENCE (Biostatistics 150) (3). Prerequisite, integral calculus. Fundamentals of probability theory; descriptive statistics; fundamentals of statistical inference, including estimation and hypothesis testing. Three lecture hours a week. Fall. Biostatistics staff.

160 DEVELOPMENTAL GENETICS (Biology 160) (3). Prerequisites, Biology 50 and 52, and permission of instructor required for undergraduates. Genetic and molecular control of plant and animal development. Extensive reading from primary literature. Fall. Bautch, Reed.

170 MUTAGENESIS AND GENETIC TOXICOLOGY (Toxicology 170) (2). Prerequisite, course in general genetics and general biochemistry. A survey of basic mechanisms of mutagenesis, its impact on populations, mutagenicity screening systems and their deployment. Two lecture hours a week. Spring. Toxicology staff.

174 ADVANCED HUMAN GENETICS (Pathology 174) (3). Prerequisites, graduate students: a previous genetics course or permission; undergraduates: a previous genetics course and permission. Topics in human genetics including the molecular basis of genetic disease, special methods used in human genetics research, and molecular genetic principles learned from studies of humans. Three lecture hours a week. Fall. (Alternate years) Farber.

189 MOLECULAR BIOLOGY TECHNIQUES (Biology 189, Biochemistry 189, Physiology 189, Pharmacology 189, Microbiology 189) (4). Prerequisites, some molecular biology; permission of the instructor. One or two week intensive courses are part of the series of Carolino Workshops. Topics vary but usually include techniques such as isolation of nucleic acids, blotting, cloning in viruses and plasmids, and DNA sequencing. Fall, spring, and summer courses available. Lab required. Fee required. Eight laboratory hours.

190 EUKARYOTIC GENE ORGANIZATION (Microbiology 190) (3). Prerequisites, organic chemistry, permission of the instructor. Basic concepts of classical chromosomal structure, function, and mechanics. Eukaryotic molecular genetics and molecular regulation are emphasized. Readings, short answer examinations, term project. Three lecture hours. Spring. Staff.

Courses for Graduates

201/202 GENETIC LECTURE SERIES (1). Diverse but current topics in all aspects of genetics. Relates new techniques and current research of notables in the field of genetics. Fall and spring. Staff and invited guest lecturers. (Open to Genetics students only)

210 SEMINAR/TUTORIAL IN PROKARYOTIC MOLECULAR BIOLOGY (Microbiology 210) (3). One or two faculty and a small number of students consider in-depth current research of importance. Emphasis is on current literature, invited speakers, etc., rather than textbooks. Fall. Bautch.

240 SPECIAL TOPICS IN GENETICS (2-4). Prerequisite, permission of the instructor. Fall. Staff.

241 SPECIAL TOPICS IN GENETICS (2-4). Prerequisite, permission of the instructor. Spring. Staff.

249 GENETICS OF COMMON DISEASES (Epidemiology 249) (3). Prerequisites, Biostatistics 150, Genetics 122 or Epidemiology 160, or permission of the instructor. Critical analysis of genetic issues in human disease. The genetics of cancer, heart disease, diabetes, mental illness, mental retardation, hypertension, and arthritis are covered. The application of genetic and epidemiological techniques are examined. Three lecture hours a week. Spring.

270 SEMINAR IN GENETICS (Biology 270) (2). Prerequisite, permission of the instructor. Two seminar hours a week. Fall and spring. Bautch, Maroni, Peters, Peifer, Pulski, Searles, Sekelsky.
275 GENETICS SYSTEMS (Microbiology 275, Biochemistry 275, Biology 275) (1). A course to provide public lecture experience to advanced genetics students. Students present personal research seminars based on their individual dissertation projects. Lectures are privately critiqued by fellow students and genetics faculty. Required of all candidates for the degree in genetics. Fall and spring. Genetics staff.

281 STATISTICAL METHODS IN HUMAN GENETICS (Biostatistics 281) (3). Prerequisite, permission of the instructor. An introduction to statistical procedures in genetics. Hardy-Weinberg equilibrium, linkage disequilibrium, segregation analysis, linkage analysis methods (including usage of genetics of software packages), and analysis of molecular genetic data. Three lecture hours a week. Spring. (Alternate years.) Biostatistics staff.

305 RESEARCH IN GENETICS (3 or more). May be continued for credit two or more semesters. Hours and credits to be arranged. (Throughout the year.) Genetics staff.

350 TRAINING IN GENETIC TEACHING (3). Prerequisites, two courses in genetics and permission of the instructor. Principles of genetic pedagogy. Students are responsible for assistance in teaching genetics and work under the supervision of the faculty with whom they have regular discussion of methods, content, and evaluation of performance. (Throughout the year.) Staff.

393 MASTER'S THESIS (3 or more). (Special permission required). Students are not accepted directly into M.S. program. (Throughout the year.) Staff.

394 DOCTORAL DISSERTATION (3 or more). (Throughout the year.) Staff.

DEPARTMENT OF GEOGRAPHY

LAWRENCE E. BAND, Chair

Professors

Lawrence E. Band (21) Geographic Information Systems, Hydroecology, Geomorphology
Stephen S. Birdsell (5) Cultural Landscapes, North America
Wilbert M. Gester (11) Health Care, Cultural, Africa, Quantitative
David E. Greenland (20) Climatology, Bioclimatology
Melinda S. Meade (10) Medical Geography, Population, and Southeast Asia
Risa I. Palm (22) Natural Hazards, Urban Social
John Pickles (26) International Studies, Regional Development, Geographic Thought, Political Economy
Peter J. Robinson (9) Climatology, Climatic Impacts, Hydroclimatology

Associate Professors

Altha J. Cravey (17) Latin America, Social
John W. Florin (8) Population, Medical, Historical Anglo-America
Charles E. Konrad (16) Synoptic Climatology and Meteorology
Aaron Moody (16) GIS, Biogeography
Thomas M. Whitmore (13) Cultural Ecology, Latin America, Population

Assistant Professors

Scott L. Kirsch (23) Historical and Political Geography, Science, Technology, and Environment
Gonghe Song (24) GIS, Remote Sensing, Earth Systems Science
Wendy Wolford (25) Latin America, Social Movements

Adjunct Faculty

Richard Bilbro (Economics), Demography, Development and the Environment, Environment and Society, Research Methods
Arturo Escobar (Anthropology), Anthropology of Development, Social Movements, Science and Technology, Political Ecology, Latin America
James Fraser (Sociology), Urban Studies, Social Inequality, Poverty/Anti-Poverty Movements, Qualitative Methods, Organizations

Carol Hanchette (Research Triangle Institute), GIS, Medical, Research Methods
Kenneth Hillis (Communication Studies), Media and Cultural Studies
James H. Johnson Jr. (School of Business), Urban, Social, Population
Martin W. Lewis (Duke University), Global Geography, History of the Classification of Oceans and Sea Spaces
Stephen McGregor (Carolina Population Center), GIS, Remote Sensing, Physical
Sam Pearsall (The North Carolina Nature Conservancy), Landscape Ecology, Ecosystem and Ecological Conservation
Sethu Ramaswamy (North Carolina State University), Fluid Dynamics, Modeling

Courses for Graduates and Advanced Undergraduates

109 CONTEMPORARY TOPICS IN GEOGRAPHY (Var). Fall, spring. Staff.
110 FUNDAMENTAL CONCEPTS OF PHYSICAL GEOGRAPHY (3). Prerequisite, Geography 10 or equivalent. Systematic study of the approaches, key concepts, and methods of physical geography. Emphasis given to geomorphic and biogeographic processes and techniques within a thematic framework. Greenland.

112 SYNOPTIC METEOROLOGY (3). Prerequisite, Geography 10 or 11. An analysis of synoptic weather patterns and the processes responsible for them. Climatological aspects of these weather patterns are emphasized. Greenland, Konrad, Robinson.

114 PHYSICAL CLIMATOLOGY (3). Prerequisite, Geography 10 or 11. The factors causing climates and their spatial variation are considered. Particular attention is paid to climate models and to the nature, causes, and impacts of climate change. Greenland, Konrad, Robinson.

116 APPLIED CLIMATOLOGY (3). Prerequisites, Geography 112 or 114. Students investigate the ways climatic information and techniques can be applied to societal problems such as energy production, food production and health. Discussion of case studies utilizing North Carolina data. Greenland, Konrad, Robinson.

120 FUNDAMENTAL CONCEPTS OF HUMAN GEOGRAPHY (3). A systematic study of the approaches, key concepts, and methods of human geography. Emphasis is given to the cultural landscape and location analysis within a thematic rather than a regional framework. Florin.

123 SOCIAL GEOGRAPHY (3). A study of spatial components of current social problems such as poverty, race relations, environmental deterioration and pollution, and crime. Cravey, Welford.

125 SPACE, PLACE, AND DIFFERENCE (Women's Studies 125) (3). Gender, race, and class are examined in terms of the spatial patterns of everyday life, regional patterns, and global patterns. Cravey.

128 URBAN GEOGRAPHY (3). A geographical study of the spatial structure and function or urban settlements. Emphasis is on the regional relations of cities and central place theory. Staff.

132 THE WORLD'S FOOD SUPPLY (3). Students study the environmental parameters, cultural preferences, technological developments, and spatial economic infrastructure which result in world patterns of food consumption, production, and distribution. Whitmore, Florin.

134 THE CULTURAL ECOLOGY OF URBANIZATION, AGRICULTURE, AND DISEASE (3). Examines the role of interactions of cultures, environments, and human diseases in the quest for sustainable agriculture by examining the cultural ecology of systems and their human diseases. Meade.

135 ENVIRONMENTAL POLITICS (3). This course brings geographical perspectives on place, space, scale, and environmental change to the study of environmental politics. In lectures, texts, and student research, we examine topics including environmental health risks, globalization and urban environments, and the role of science in environmental politics.

137 NATURAL RESOURCES (3). An analysis of selected biological and mineral resources of the world with particular emphasis on their distribution, utilization, management policies, and on their social and economic implications. Hawley.

140 EARTH SURFACE PROCESSES (Geological Sciences 147) (3). Prerequisites, Geography 10 or Geography 11. Focuses on the processes of soil formation, erosion, and landform evolution, with an emphasis on the interaction of geomorphic processes with surface hydrology and ecosystems. Band.


143 ECOLOGICAL PLANT GEOGRAPHY (Biology 143) (3). Prerequisite, Biology 11 or Geography 38. Description of the major vegetation types of the world including their distribution, structure, and dynamics. Discussion of the principle causes for the distribution of plant species and communities, such as climate, soils, and history. (Alternate years.) Moody.

144 LANDSCAPE BIOGEOGRAPHY (3). This course is concerned with the application of biogeographical principles and techniques to the study of natural and human-modified landscapes. It includes local and extraregional case studies. Moody, Band.

145 MEDICAL GEOGRAPHY (3). Students study the human ecology of health by analyzing the cultural/environmental interactions that tie behind world patterns of disease distribution, diffusion, and treatment, and the ways these are being altered by development of worldwide health care delivery systems, manpower and facility distributions, accessibility, and utilization. Meade.

146 GEOGRAPHY OF HEALTH CARE DELIVERY (3). This course covers basics, including personnel and facility distributions, accessibility, regionalization, and location/ allocation modeling; spatial analysis and GIS; and the cultural geography of health care, including humanist and political economic perspectives. Gesler.

150 POPULATION GEOGRAPHY (3). A study of the spatial dimensions of population growth, density and movement, and of the shifts in these patterns as they relate to changes in selected socioeconomic environmental and cultural phenomena. Florin, Meade, Whitmore.

153 POLITICAL GEOGRAPHY (3). Prerequisite, Geography 59 or permission of instructor. The geography of politics is explored at the global, the nation-state, and the local scale in separate units, but the interconnections between these geographical scales are emphasized throughout. Cravey, Kirsch.

154 HISTORICAL GEOGRAPHY OF THE UNITED STATES (Folklore 154) (3). A study of selected past geographies of the United States with emphasis on the significant geographic changes in population, cultural, and economic conditions through time. Florin.

157 RURAL LATIN AMERICA: AGRICULTURE, ENVIRONMENT, AND NATURAL RESOURCES (3). Prerequisite, Geography 59 or permission of instructor. Explores a systems and cultural-ecological view of agriculture, environment, natural resource, and rural development issues in Latin America. Complements 158 Urban Latin America. Whitmore.

158 URBAN LATIN AMERICA: POLITICS, ECONOMY, AND SOCIETY (3). Prerequisite, Geography 59 or permission of instructor. Examines contemporary issues in urban Latin America, including geographical concepts, political trajectories of individual countries, and urban-based activist social movements. Cravey.

161 THE SOUTH (3). Present-day southern United States, approached historically through a study of its physical, economic, and cultural environment. Florin.

164 EUROPE TODAY (3). A survey by topic and country of Europe west of the Soviet Union. Those features that make Europe a distinct and important region today are emphasized. Hawley.

166 EASTERN ASIA (Asian Studies 166) (3). Students study the geographical structure of population, urbanization, agriculture, industrialization and regional links in China, Japan, and Korea. Eyer.

167 TROPICAL ASIA (Asian Studies 167) (3). The cultural diversity and regional organization, emphasizing the spatial structure and contemporary dynamics of population, agriculture, urbanization, and economic development, primarily of the nations of Southeast Asia. Meade.

168 AFRICA (3). This course emphasizes the dynamic spatial organization of Africa south of the Sahara. Individual countries will be studied in view of their geographic characteristics and problems. Gesler.
177 REMOTE SENSING OF THE ENVIRONMENT (3). Prerequisite: Geography 70. Introduction to satellite imaging of the Earth's surface, and the extraction of information about the characteristics and changes occurring on Earth. A wide range of image types and applications are considered through lectures and hands-on experience. Fall. Moody.

178 ADVANCED REMOTE SENSING (3). Prerequisite: Geography 70, 177 or equivalent. Acquisition, processing, and analysis of satellite digital data for the mapping and characterization of landcover types. Walsh, Moody, Song.

190 QUANTITATIVE METHODS IN GEOGRAPHY (3). Introduces students to the application of statistical methods to geographic problems with some computer use in their solution. Attention given to analysis of areal data and areal sampling. Gesler, Konrad.

191 INTRODUCTION TO GEOSPATIAL INFORMATION SYSTEMS (City and Regional Planning 136) (3). Prerequisite: Geography 70. Stresses the spatial analysis and modeling capabilities of organizing data within a geographic information system. Moody, Walsh, Song.

192 APPLIED GEOGRAPHIC INFORMATION SYSTEMS (3). Prerequisite: Geography 170 or 191. Applied issues in the use of geographic information systems in terrain analysis, medical geography, biophysical analysis, and population geography. Walsh, Moody.

Courses for Graduates

202 CONTEMPORARY GEOGRAPHIC THOUGHT (3). History and philosophy of geographic discipline, with particular emphasis on developments in recent decades. Fall. Kirsch.

203 GEOGRAPHIC RESEARCH DESIGN (3). Introduction to the theory and practice of geographic research. The range of methods available for problem identification and solution are considered through development of specific research proposals. Spring. Staff.

204 COMMUNICATING GEOGRAPHY (1). An introduction to methods of verbal and visual communication of geographic material and ideas. This will include: assisting with teaching college level classes; organizing such classes; evaluating students; teaching with presentation of maps, graphics, and current classroom technology; preparing presentations for professional meetings and maximizing the value of attending. Fall. Meade.


210 ADVANCED PHYSICAL GEOGRAPHY (3). Further treatment of the physical environment. The course emphasizes special problems relating to the interrelationships among the natural and human environments. Staff. Band, Greenland.

240 ADVANCED REGIONAL GEOGRAPHY (3). Selected features, developments and problems of human geography in major world regions. (On demand.) Staff.

290 SPATIAL ANALYSIS AND COMPUTER MODELING (3). This course introduces students to spatial analysis techniques involving points, lines, areas, surfaces, and nonmetric spaces and programming basic geographic models on microcomputers. Gesler, staff.

299 SPECIAL WORK IN GEOGRAPHY (2 or more). Prerequisites, two courses in the one hundred brackets, or permission of the instructor. (On demand.) Staff.

302 SEMINAR IN ECONOMIC GEOGRAPHY (3). Wolford, Crayev.

303 SEMINAR IN GEOGRAPHIC INFORMATION SYSTEMS (3). Walsh, Moody.

304 SEMINAR IN POLITICAL GEOGRAPHY (3). Kirsch.

305 SEMINAR IN HISTORICAL GEOGRAPHY (3). Florin.

306 SEMINAR IN REGIONAL GEOGRAPHY (3). Staff.

307 SEMINAR IN URBAN GEOGRAPHY (3). Birdsell.

308 SEMINAR IN PHYSICAL GEOGRAPHY (3). Walsh, Moody, Band.

309 SEMINAR IN MEDICAL GEOGRAPHY (3). Meade, Gesler.

310 SEMINAR IN POPULATION GEOGRAPHY (3). Florin, Meade, Whitmore.

311 RESEARCH IN GEOGRAPHY (2 or more). (On demand.) Staff.

a. Political
b. Historical
c. Regional
d. Urban
e. Physical
f. Social
g. GIS

312A SEMINAR IN HUMAN GEOGRAPHY: LANDSCAPE AND MEANING (3). Examines alternative definitions of landscape, groups and the responses by which landscape meaning is achieved. Gesler, staff.

312B SEMINAR IN HUMAN GEOGRAPHY: SOCIETY AND SPACE (3). Examines the interaction between social and spatial theory and practice as expressed in the work of leading figures in social science. Gesler, Staff.

316 SEMINAR IN CLIMATOLOGY (3). Examines questions of global climate change, climate modeling, climate teleconnections, and climate patterns. Robinson, Konrad.

317 SEMINAR IN REMOTE SENSING (3). Prerequisite: Geography 173 or 177. Selected topics in the field of advanced remote sensing. Walsh, Moody, Song.

393 MASTER'S THESIS (3 or more). Fall or spring. Members of the graduate faculty.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Members of the graduate faculty.

DEPARTMENT OF GEOLOGICAL SCIENCES

TIMOTHY J. BRALOWER, Chair

Professors

John M. Bane Jr. (24) Physical Oceanography
Larry E. Benninger (17) Low-Temperature Geochemistry
Timothy J. Bralower (30) Micropaleontology, Marine Stratigraphy
Joseph G. Carter (15) Paleocology, Invertebrate Paleontology
Paul D. Fullagar (4) Isotope Geochemistry
Allen F. Glazner (20) Igneous Petrology, Tectonics
Christopher S. Mattews (7) Chemical Oceanography
Jose A. Rial (26) Geophysics, Seismology
John T. Wells (25) Coastal Geomorphology, Sedimentation

Associate Professors

Louis R. Bartek (56) Sedimentology, Stratigraphy, Marine Geology
Jonathan M. Lees (37) Seismology, Geophysical Inverse Theory
Kevin G. Stewart (27) Structural Geology

Assistant Professors

Walter A. Barnhardt (39) Coastal Geology
Drew S. Coleman (38) Isotope Geochemistry, Geochronology

Research Assistant Professor

Brent V. Miller, Isotope Geology

Adjunct Appointments

Charles C. Daniel III (33) Hydrology
Professors Emeriti
John M. Dennison
Roy L. Ingram
A. Conrad Neumann
John J. W. Rogers
Joseph St. Jean Jr.
Daniel A. Textoris
William A. White

The Department of Geological Sciences offers programs leading to the M.S. and Ph.D. degrees in geological sciences. A broad background is offered in most major areas of geoscience, with particular emphasis on isotope geochemistry, geochronology, seismology, volcanology, igneous petrology, marine geology, low-temperature geochemistry, paleoceanography, paleontology, paleoecology, sequence stratigraphy, structural geology, and tectonics.

Admission and General Degree Requirements

Students admitted to pursue a graduate degree in the Department of Geological Sciences normally are expected to have an undergraduate degree in traditional geology, geochemistry, geophysics, biology, chemistry, mathematics, physics, or other related interdisciplinary fields. All applicants must take the Graduate Record Examination. All foreign students whose native language is not English also must take the TOEFL examination.

Incoming graduate students are required to take Geology 300, Research Seminar in Geology, during their first fall semester in residence and to select a hard-rock, soft-rock, or geophysics track in geology; this track determines other required courses. Additional course requirements will be determined by individual graduate committees, often in consultation with the director of graduate studies. Specific requirements are varied to meet the needs and career objectives of the individual.

Master of Science

Requirements for the Master of Science degree are: thirty semester hours (six of which may be credit for thesis); a written comprehensive examination taken after most of the course work has been completed; a thesis; and a final oral examination in defense of the thesis.

Doctor of Philosophy

Normally a student must have completed a master's degree before being admitted to the doctoral program. A student may be permitted to bypass the master's degree after one year of residence upon demonstration of superior scholastic performance and research potential, recommendation of his or her graduate committee, and approval by the Geological Sciences faculty.

Admission to the Ph.D. program after completing the M.S. degree in the Department of Geological Sciences requires faculty approval.

Requirements for the Ph.D. degree are: a minimum of forty-five semester hours of graduate credit (which may include thirty hours from the M.S. degree) plus a minimum of six hours of credit for the dissertation; a written comprehensive examination and an oral comprehensive examination; a dissertation; and a final oral examination in defense of the dissertation.

Facilities and Research Interests

The Department of Geological Sciences occupies the 50,000 square feet of floor space in Elisha Mitchell Hall, and houses a departmental library which contains more than 47,000 volumes as well as periodicals, maps, and electronic resources in the geosciences.

Research equipment and facilities include: thermal ionization mass spectrometer; two Class 100 clean labs; direct current plasma spectrometer; X-ray diffraction; flame- and graphite-furnace atomic absorption spectrometer; scanning electron microscope; counting laboratory (alpha-, beta-, and gamma-emitting radionuclides); benzene 14C laboratory; gas chromatograph–combustion–isotope mass spectrometer; ICP mass spectrometer and electron microprobe (at Duke University); chip sonar and side-scan sonar imaging systems; Landmark Graphics Geological Interpretation System; seismic reflection system; grain-size analysis equipment; core x-radiograph. The department also has a variety of computing resources, which includes Macintosh and Windows-based computers, UNIX workstations, a GIS/mapping laboratory, and computer graphics and imaging facilities. A Silicon Graphics Origin 2000 provides centralized scientific computing on campus, and a Cray supercomputer cluster is available at the North Carolina Supercomputing Center. UNC-Chapel Hill and Duke University jointly operate the R/V Cape Hatteras, a part of the UNOLS oceanographic research fleet, which is docked at the Duke Marine Lab in Beaufort, North Carolina.

Financial Aid

Approximately seventeen graduate and teaching assistantships with stipends of $11,000–$12,600 per academic year (2000–2001 stipends) are available to graduate students.

The department nominates one or two students to be considered by the Graduate School for non-service fellowships; no additional application is necessary. Faculty research grants support some research assistantships. Out-of-state students are recommended for remission of out-of-state tuition costs; all students are recommended for an In-State Tuition Award. Most students are eligible for both, and therefore, are responsible only for the payment of student fees.

Courses for Graduates and Advanced Undergraduates

101 OCEANOGRAPHY (Marine Sciences 101, Biology 126, Environmental Sciences 127) (3). Prerequisites: major in a natural science or at least two college-level courses in natural sciences. The origin of ocean basins, chemistry and dynamics of seawater, biological communities and processes, the sedimentary record, and the history of oceanography. Term paper. Intended for students with college science background; other students should see Geology 12. Fall, spring. Staff.

102 ARCHAEOLOGICAL GEOLOGY (Anthropology 102) (3). Prerequisite, permission of the instructor. The application of geological principles and techniques to the solution of archaeological problems. Geological processes and deposits pertinent to archaeological sites, geological framework of archaeology in the southeastern United States, and techniques of archaeological geology and site analysis are studied. Field trips to three or more sites are conducted; written reports on geological aspects of the sites are required. Not open to geology graduate students for graduate credit. (On demand) Staff.

105 CHEMICAL OCEANOGRAPHY (Environmental Sciences 128, Marine Sciences 105) (4). Prerequisites, one semester of physical chemistry or Environmental Sciences 122 or Chemistry 180, or permission of the instructor. Variation and abundance of sea constituents and the chemical, physical, and biological processes contributing to their distribution, as well as problems of dispersion of conservative and nonconservative substances. Three lecture and two recitation hours a week. Spring. Martens, Arnosti, Atherin.

106 PHYSICAL OCEANOGRAPHY (Marine Sciences 106) (4). Prerequisites, Mathematics 31, 32, Physics 24, 25, or permission of the instructor. Descriptive regional oceanography; equations of motion, the Ekman layer, wind-driven currents, thermohaline circulation, modern observations, waves, tides. Four lecture hours a week. Fall. Bane.

111 EARTH PROCESSES IN ENVIRONMENTAL SYSTEMS (Environmental Studies 101, Marine Sciences 111) (4). Prerequisites, Mathematics 31, Chemistry...
112 OCEANIC PROCESSES IN ENVIRONMENTAL SYSTEMS (Environmental Studies 102, Marine Sciences 112) (4). Prerequisites, Mathematics 31, Biology 11, Chemistry 21, Physics 25 or 27, Marine Sciences 54, or permission of the instructor. Principles of analysis of the ocean, coastal, and estuarine environments, and the processes that control these environments, are applied to the analysis of environmental phenomena. The link between the oceanic and other environmental compartments is explored through case studies of environmental issues. Three lecture hours and one lab hour a week. Fall. Bennenger, Band.

115 BIOGEOCHEMICAL PROCESSES (Environmental Studies 105) (4). Prerequisites, Mathematics 31, Biology 11, Chemistry 51 or 61, Physics 25 or 27, Geology 41 or 45, or permission of the instructor. Principles of chemistry, biology, and geology are applied to analysis of the fate and transport of materials in environmental systems, with emphasis on those materials that form the most significant cycles. The course examines these processes in systems that contain the atmosphere, lithosphere, biosphere, and climate. Three lecture hours and one lab hour a week. Fall. Staff.

116 ENVIRONMENTAL SYSTEMS MODELING (Environmental Studies 106, Marine Sciences 116) (3). Prerequisites, Mathematics 83, Physics 25 or 27 (may be taken concurrently), or permission of the instructor. Methods for developing explanatory and predictive models of environmental processes are explored. Includes discussion of the relevant scientific models of analysis, mathematical methods, computational issues, and visualization techniques. Two lecture hours and one computer lab hour a week. Spring. Rial, Werner.

117 PALEOECEANOGRAPHY (3). Prerequisite, Geology 57 or 188, or permission of the instructor. Origin and distribution of pelagic sediments. Review of the major Mesozoic and Cenozoic events in the world oceans. Glacial/interglacial changes in the ocean/atmosphere system. Fall. Staff.

118 GEOLOGICAL RESEARCH TECHNIQUES (2). Prerequisite, permission of the instructor. An introduction to methods of obtaining, analyzing, and presenting geological and paleontological data. Fall. Carter.

119 GEOLOGICAL AND OCEANOGRAPHIC APPLICATIONS OF GEOGRAPHICAL INFORMATION SYSTEMS (Marine Sciences 129) (4). Prerequisites, four natural science courses or permission of instructor. Focus is on applying GIS concepts and techniques to mining and petroleum geology, resource assessment, hydrogeology, coastal and marine geology, physical oceanography, engineering geology, and a geological perspective on land use. Spring. Staff.


123 MARINE CARBONATE ENVIRONMENTS (Marine Sciences 123) (4). Prerequisite, permission of the instructor. Chemical and biological origins of calcium carbonate, skeletal structure, and chemo-mineralogy, preservation, sedimentation, and early diagenesis are studied in a variety of deep and shallow environmental settings, in order to understand skeletal genesis. Limestone origin, and carbonate facies variability. Field trip to Florida, Bahamas, or Bermuda. Lab exercises; research report. Spring. (Alternate years.) Staff.

125 COASTAL SEDIMENTARY ENVIRONMENTS (Marine Sciences 125) (3). Prerequisite, Geology 57. An introduction to modern shallow-water clastic environments and their sediments, emphasizing barrier islands, deltas, estuaries, wetlands, and tidal flats. Includes local field trips and discussion/application of data-collecting techniques. Fall. Barnhardt, Wells.

128, 129 SUMMER FIELD COURSES IN GEOLOGY (6). Prerequisites, Geology 52, 53, 56, 57, 58. Six-week field camp conducted in New Mexico, Arizona, and Colorado. Field interpretation of rocks and their deformation; construction of geological maps; introduction to hydrology. Includes field trips to classic localities such as the Grand Canyon. First summer session only. Staff.

130 TOPICS IN EARTH AND ENVIRONMENTAL SCIENCES (3). Key topics and resources for high school teachers preparing to teach Earth and Environmental Sciences. Includes geology, tectonic processes, hydrogeology, atmosphere, origin of solar system and life, and environmental stewardship. Spring, summer. Fullagar.

132 INVERTEBRATE PALEONTOLOGY (Biology 110) (4-5). Prerequisite, Geology 16 or Biology 11, or permission of the instructor. Study of major invertebrate phyla in the geologic record. Five credit hour classes include an internship (once a week) at the North Carolina Museum of Natural History at part of the APPLES service learning program in addition to the laboratory taught on campus. Fall. Carter.

133 MICROPALEONTOLOGY (Marine Sciences 133) (4). Prerequisite. Geology 132, Marine Sciences 146, or permission of the instructor. An in-depth study of the biostatigraphic, paleoecology, and taxonomy of various microfossil groups (e.g., Foraminifera, ostracods, conodonts, coccoliths, Radiolarians, dinoflagellates, etc.) depend upon individual student objectives. Three lecture and three laboratory hours a week. (On demand.) Bralower.

136 SEQUENCE AND SEISMIC STRATIGRAPHY (3). Prerequisite, Geology 57. Examination of lithostratigraphic principles and the sequence stratigraphic paradigm. Students study use of variation of well log signature reflection attributes and reflection termination patterns to identify and correlate sequences and systems and interpret the lithology and depositional history of subsurface stratigraphic units. Fall. Barrek.

137 FIELD PALEONTOLOGY (4). Prerequisites, Geology 11, 16, 18 or 41 and Geology 57 or 152, or permission of the instructor. A field-oriented course on the Triassic through recent strata of the southeastern United States, including their geological framework and their litho- and biostratigraphic classification. Three lecture and two laboratory hours a week. Fall. (Alternate years.) Carter.

138 GEOMORPHOLOGY (3). Prerequisite, Geology 11 or 41. The origin of landforms. Includes those formed by weathering, mass wasting, streams, distillation of limestone, coastal processes, glaciation, and wind. Fall. Dennison.

138L GEOMORPHOLOGY LABORATORY (1). Prerequisite or corequisite, Geology 138. Two laboratory hours a week. Fall. Dennison.

139 RIVER SYSTEMS OF EAST COAST NORTH AMERICA (3). Prerequisites, Geology 11 or 41, Geology 48 or 138; at least junior status. Analysis of twenty-three rivers from St. Lawrence to the Everglades, from headwaters to oceanic terminus of turbidity fan. Focus on stream processes, geological development, hydrology, utilization history, ecology, and planning. Spring. (Alternate years.) Dennison.

140 BIOGEOCHEMICAL CYCLING (Marine Sciences 140) (3). Prerequisites, Geology 145, 146, or 164, or Environmental Sciences 133 or Marine Sciences 105 or permission of the instructor. Biogeochemical cycling explores interfaces between marine, aquatic, atmospheric, and geological sciences, emphasizing processes controlling chemical distributions in sediments, fresh and salt water, the atmosphere, and fluxes between these reservoirs. Spring. Martens, Alperin, Arnosti.

141 MODELING OF MARINE AND EARTH SYSTEMS (Marine Sciences 152) (1-3). Prerequisites, Mathematics 32 or permission of the instructor. Mathematical modeling of the dynamic systems, linear and nonlinear. The fundamental budget equation. Case studies in modeling convective transport, biogeochemical processes, population dynamics. Analytical and numerical techniques, chaos theory, fractal geometry. Three lecture hours per week. Spring. Werner, Rial.

142 INTRODUCTION TO GEOPHYSICS (3). Introduction to the fundamentals of global geophysics: gravity, seismology, magnetism, heat and plate tectonics. Both shallow and deep processes are considered. Emphasis is aimed at problem solving by applying concepts. Fall. (Alternate years.) Lee.
143 DESCRIPTIVE PHYSICAL OCEANOGRAPHY (Marine Sciences 156) (3).
Prerequisites, Marine Sciences 106 or permission of the instructor. Observed structure of the large-scale and mesoscale ocean circulation and its variability, based on modern observations. In situ and remote sensing techniques, hydrographic structure, circulation patterns, ocean-atmosphere interactions. Spring. (Alternate years.) Base.

144 ORGANIC GEOCHEMISTRY (Marine Sciences 140) (3). Prerequisites, Marine Sciences 105 or Chemistry 61 or permission of the instructor. Sources, transformations, and fate of natural organic matter in marine environments. Emphasis on interplay of chemical, biological, and physical processes affecting organic matter composition, distribution, and turnover. Fall. (Alternate years.) Base.

145 GEOCHEMISTRY (Marine Sciences 145) (3). Prerequisites, Geology 11 or 41, Chemistry 21, or permission of the instructor. Introduction to the application of chemical principles to geological problems, with emphasis on isotopic methods. Spring. (Alternate years.) Base.

146 PHYSICAL GEOCHEMISTRY (4). Prerequisites, Chemistry 21, Mathematics 32, or permission of the instructor. An introduction to physical geochemistry and chemical thermodynamics with special emphasis on geological applications. Three lectures and three laboratory hours a week. Fall. (Alternate years.) Base.

147 EARTH SURFACE PROCESSES (Geography 140) (3). Prerequisite, Geography 10 or Geology 11. Focuses on the processes of soil formation, erosion, and landform evolution, with an emphasis on the interaction of geomorphic processes with surface hydrology and ecosystems. Fall. (Alternate years.) Base.

150 HISTORY OF THE EARTH (3). Prerequisites, Geology 11, 13, 15, 18, or 41 and 52, 53, 55, and 58, or permission of the instructor. History of the earth's surface and internal systems including biologic evolution; development of oceans, atmosphere, and climate; plate tectonic processes; evolution of crust and mantle. Fall. Staff.

151 GEODYNAMICS (3). Prerequisites, Geology 11 or 41, Mathematics 32, Physics 24, 25, Chemistry 21. Interior of the earth deduced from seismology; gravity, heat flow, magnetism; geophysics of continents and ocean basins; age of earth. Spring. Staff.

152 DATA ANALYSIS IN THE EARTH SCIENCES (3). Prerequisites, an introductory geological science course, Calculus I and II, or permission of instructor. Introduction to quantitative analysis in earth sciences: solid earth, atmospheres, oceans, geochemistry and paleontology. Topics covered: univariate and multivariate statistics, testing, non-parametric methods, time series, spatial and cluster analysis, shapes. Spring. Lett.

157 PROBLEMS IN VERTEBRATE EVOLUTION (Biology 157) (3).
Prerequisite, Biology 63 or permission of the instructor. A study of the major transitions in vertebrate evolution and associated problems in evolutionary biology; structural change, paleoecology, biogeography and earth history, physiology and behavior. (On occasion.) Fidduccia.

163 APPLIED HYDROLOGY (3). Prerequisites, Geology 11 or 41, Mathematics 31, Physics 25, or permission of the instructor. An introduction to methodologies and instrumentation for quantifying the movement of water in the earth system focusing on components of the hydrologic cycle. Emphasis is divided between analytical aspects and field procedures. Spring. Daniel.

164 GEOCHEMISTRY OF NATURAL WATERS (3). Prerequisites, Geology 11, 13, 15, 18, or 41, Chemistry 21, Mathematics 31, or permission of the instructor. Survey of processes affecting the compositions of streams, lakes, the ocean, and shallow groundwaters. Spring. (Alternate years.) Staff.

165 GROUNDWATER (3). Prerequisites, Geology 11, 13, 15, 18, or 41, Chemistry 21, Mathematics 31, Physics 24, 26, or permission of the instructor. Introduction to physics, chemistry, and geology of groundwater. Fall. (Alternate years.) Base.

173 TOPICS IN PETROLOGY (4). Prerequisite, Geology 53. Origin of magmas and evolution of igneous and metamorphic rocks, combined with petrographic study of selected sites and individual examples. Two lecture and six laboratory hours a week. Spring. Glazner.

181 FLUID DYNAMICS (Marine Sciences 151, Physics 151) (3). Prerequisite, Physics 103 or permission of the instructor. The physical properties of fluids, kinematics, governing equations, viscous incompressible flow, vorticity dynamics, boundary layers, irrotational incompressible flow. Fall. Shay.

182 ADVANCED STRUCTURAL GEOLOGY (3). Prerequisites, Geology 38, Physics 24 or 26. Theoretical and experimental methods in structural geology; strain analysis; mechanical behavior of rocks. Spring. (Alternate years.) Stewart.

184 ADVANCED FIELD SEMINAR IN GEOLOGY (1-4). Prerequisites, Geology 128 and 129 or equivalent. A field course that emphasizes advanced field methods. Emphasis is placed on large-scale, detailed field work in complex structural terrains and on independent mapping that will lead to thesis/dissertation and/or publication. (On demand.) Glazner.

188 GEOLOGICAL OCEANOGRAPHY (Marine Sciences 103) (4).
Prerequisites, Geology 11 or 41, or permission of the instructor. Ocean basin origin, continental margin development, coastal geology, carbonate platforms, and pelagic sediments are subjects covered; paleoceanographic reconstructions are emphasized. Three lecture and two laboratory hours a week. Spring. Neumann.

197 PALEOBOTANY (Biology 181) (5). Prerequisites, Biology 11-111, and permission of the instructor. An introduction to the morphology, stratigraphic occurrence, and evolutionary relationships of fossil plants. Both macrofossils and microfossils are considered. Three lecture and three laboratory hours a week. Spring. (Alternate years.) Gesnel.

199 SPECIAL PROBLEMS IN GEOLOGY (1-4). Independent research under the direction of a geology faculty member on an interesting geological topic. Registration requires the approval of the department chair. Fall and spring. Staff.

Courses for Graduates

202 SEDIMENTARY GEOLOGY I (3). Prerequisites, Geology 57, or equivalent, or permission of the instructor. Stratigraphic, sedimentologic, geochemical, petrologic, and paleontologic principles will be summarized. Emphasis is placed on both the techniques used in sedimentary geology and on the characteristics and processes that distinguish sedimentary environments. Fall. Brawley, Bartel.


204 ADVANCED PETROLOGY I (3). Prerequisites, Chemistry 21, Mathematics 33, Physics 25, Geology 53. Application of thermodynamics, phase equilibria, thermobarometry, radiogenic and stable isotope geology, and geochemical modeling to the study of igneous and metamorphic rocks and crustal evolution. Fall. Fullagar, Glazner.

205 ADVANCED PETROLOGY II (3). Prerequisite, Geology 204. Continuation of Geology 204. Spring. Fullagar, Glazner.


225 CLASTIC DEPOSITIONAL SYSTEMS: PROCESSES AND PRODUCTS (3). Prerequisite, Geology 57. Examination of the use of lateral and vertical changes in sedimentary facies to identify depositional processes and environments of deposition within the terrestrial, marginal marine, shelf, and deep sea clastic depositional systems. These systems will be examined in a sequence stratigraphic framework. Spring. Bartel.

246 ADVANCED MINERALOGY (3). Prerequisite, Geology 52. Principles of crystal chemistry; X-ray diffraction methods; linear algebraic and computer methods in crystallography. (On demand.) Glazner.


264 ADVANCED IGNEOUS PETROLOGY (4). Prerequisites, Geology 146 and 173. Applications of phase equilibria and thermodynamics to studies of the origin and evolution of magmas. Three lecture and three laboratory hours a week. (On demand.) Glazner.

265 METAMORPHIC PETROLOGY (4). Prerequisites, Geology 53 and 173, or permission of the instructor. Studies in the occurrence of metamorphic rocks in orogenic belts and their mineralogical, textural, and structural evolution. Two lecture and six laboratory hours a week. Spring. (On demand.) Staff.

266 IGNEOUS GEOCHEMISTRY (4). Prerequisite, Geology 146. Study and critique of thermobarometry, major- and trace-element modeling, and isotope methods in igneous petrology, using case studies from current literature. Three lecture and three laboratory hours a week. (On demand.) Glazner.


280 TECTONOPHYSICS (3). Prerequisites, Mathematics 34, Physics 52, 58, or permission of the instructor. Fundamental physical processes necessary for an understanding of plate tectonics: stress and strain in solids; elasticity and flexure; heat transfer; gravity; mantle rheology and convection. Fall. (Alternate years.) Lees, Rial.

300 RESEARCH SEMINAR (1). Required of all entering graduate students or permission of the chair. A topical seminar in current research topics in the earth sciences. Presentations by selected faculty with an emphasis on in-depth, critical analysis of current research literature. Two hours a week. Staff.

301 SEMINAR (1 or more). Offered as needed. Staff.

302 SEMINAR IN STRATIGRAPHY (1 or more). Offered as needed. Staff.

306 SEMINAR IN PALEOECOLOGY (1 or more). Offered as needed. Staff.

310 SEMINAR IN PALEONTOLOGY (1 or more). Offered as needed. Staff.

318 SEMINAR IN CONTINENTAL MARGINS (1 or more). Offered as needed. Staff.

320 SEMINAR IN SEDIMENTOLOGY (1 or more). Offered as needed. Staff.

345 SEMINAR IN GEOCHEMISTRY (1 or more). Fall, spring. Benninger.

357 SEMINAR IN ISOTOPE GEOLOGY (1 or more). Offered as needed. Staff.

360 SEMINAR IN PETROLOGY (1 or more). Offered as needed. Staff.

372 SEMINAR IN ECONOMIC GEOLOGY (1 or more). Offered as needed. Staff.

376 SEMINAR IN VOLCANOLOGY (3). All aspects of volcanism will be covered including seismology, geochemistry, deep structure, volcanic products and hazards. Readings of original papers will be stressed. Spring. Lees.

380 SEMINAR IN GEOPHYSICS (1 or more). Offered as needed. Rial.

381 SEMINAR IN SEISMOLGY (1 or more). Offered as needed. Rial.

382 SEMINAR IN STRUCTURAL GEOLOGY (1 or more). Offered as needed. Stewart.

383 SEMINAR IN TECTONICS (1 or more). Offered as needed. Staff.

Research Courses

392 RESEARCH IN GEOLOGY (3 or more).

393 MASTER'S THESIS (Var.-minimum 3).

394 DOCTORAL DISSERTATION (Var.-minimum 3).

DEPARTMENT OF GERMANIC LANGUAGES

CLAYTON KOELB, Chair

Professors

Clayton Koeb (4) Modern Literature (Thomas Mann, Franz Kafka), Literary Theory, Philosophy and Aesthetics, Comparative Literature
Alice A. Kuzmireva (5) Romanistic, Cinema Studies, Gender and Sexuality Studies, Comparative Literature
Siegmund Meier (7) Nineteenth- and Twentieth-Century Literature (Berlitz Brecht, Günter Grass, etc.), Literature and Politics, Comparative Literature
David Pike (8) Twentieth-Century Literature, East German and Soviet Culture and Politics
Paul T. Roberge (9) Historical Linguistics, Old German Dialects, Comparative Germanic Grammar, Pidgins and Creoles, Afrikaans, Language, Ethnicity, and Politics

Associate Professor

Jonathan Hess (5) Eighteenth-Century Studies, German-Jewish Cultural History, Aesthetics and Literary Theory, Philosophy and Literature

Assistant Professors

Kathryn Starkey (10) Medieval Literature, Visuality and Textuality, Gender and Sexuality, Historical Linguistics, Older Germanic Dialects
Christopher Wild (11) Early Modern and Eighteenth-Century Culture and Literature, Literary Theory, Medicine and Literature

Associated Faculty

Helga Bister (2) Dialectology, Contact and Sociolinguistics, Applied Linguistics
Ross Lewin (15) German Jewish Culture, Eighteenth- and Nineteenth-Century German Literature and Intellectual History
Dan Thornton (16) Postwar German and Austrian Literature, Expressionism, New Scarlet, Golden Age and Twentieth-Century Dutch Literature, Holocaust Studies, Jewish Literature in the Diaspora
Gert Welledith (12) Syntax of Germanic Languages, Syntactic Theory

Professors Emeriti

Walter K. Francke
Richard H. Lawson
Christoph E. Schweitzer
Sidney R. Smith
Peter W. Tax

The Department of Germanic Languages offers graduate programs leading to the degrees of Master of Arts and Doctor of Philosophy. Students concentrate in either German literature or Germanic linguistics. The faculty welcomes and encourages the pursuit of interdisciplinary interests, and students regularly take courses offered by other academic units within the University (e.g., the Curriculum of Comparative Literature and the Department of Linguistics). Within the broad requirements of the Graduate School and the department, every effort is made to meet the student's individual needs. The department ordinarily expects at least one year
of teaching experience as part of the graduate program and provides rigorous training in German language teaching methodology (German 205).

Prospective students should request from the department chair a copy of the document Guide to Graduate Studies in German, which describes departmental curricula and requirements in detail.

Master of Arts in Germanic Languages

Admission: Applicants normally should have completed an undergraduate degree with a major in German.

Requirements: The M.A. degree is designed to be completed in four semesters. A minimum of thirty semester hours (typically ten courses) is required, and must include German 205 and 393 (M.A. thesis credit), and two of the following: German 160, 165, 171. Ordinarily it is expected that M.A. students will write a minimum of three course papers during the first year.

Students concentrating in German literature are also required to take German 111-112 and to take a comprehensive M.A. examination, ordinarily in the fourth semester. The reading list for the examination is identical to the syllabus for German 111-112 (which is printed in the Guide to Graduate Studies in German) plus twenty-five titles of the student's choice.

Students concentrating in Germanic linguistics take an M.A. examination in Germanic linguistics during the second year of M.A. studies at a time determined by the director of graduate studies in linguistics. Toward the end of the first year of M.A. studies, students concentrating in Germanic linguistics select four examination topics for research.

The M.A. thesis is a scholarly paper of approximately forty-five pages, the final signed copy of which is due no later than the last day of classes of the fourth semester.

Doctor of Philosophy in Germanic Languages

Admission: Applicants normally should have completed a master's degree in Germanistik or the equivalent. Only those students who have demonstrated academic excellence at the M.A. level will be admitted to the Ph.D. program.

Requirements: The Ph.D. requires a total of twenty-four semester hours beyond those required for the M.A. This typically amounts to six courses beyond the M.A. degree (if received from UNC-Chapel Hill), one of which must be German 160, 165, or 171, with an additional six hours of dissertation credit (German 394). For the most part, Ph.D. students pursue individualized programs of study.

Students concentrating in German literature elect courses in consultation with their advisor so as to gain exposure to different periods (medieval, early modern, eighteenth, nineteenth, and twentieth centuries) and to a variety of critical approaches to the study of literature. Ph.D. students are expected to enroll in no fewer than four courses (beyond those required for the M.A.) for which a final paper is required.

Students concentrating in Germanic linguistics take a variety of courses involving older Germanic dialects, comparative grammar, contemporary Germanic linguistics, Indo-European, and/or general linguistics.

Students who have earned M.A. degrees at other institutions should consult with the director of graduate studies regarding the transfer of credit. Students from other institutions take German 205 during their first year of teaching at UNC-Chapel Hill.

Ph.D. students must demonstrate reading knowledge of one foreign language (other than German) deemed relevant to a particular course of study. This is usually French, but students may petition the department to substitute some other language. Students normally take the Ph.D. examination at the end of the second year of doctoral studies. In both concentrations—German literature and Germanic linguistics—the Ph.D. examination allows students to investigate areas of particular interest (from which a dissertation topic will emerge), while it observes the Graduate School's requirement of comprehensiveness.

To be admitted to candidacy for the degree of Doctor of Philosophy, students must have completed all course work, fulfilled the foreign language requirement, passed the Ph.D. examination, and developed a satisfactory dissertation prospectus. All students must write an acceptable dissertation based on independent research.

Financial Aid

The department nominates outstanding students for competitive non-servicce fellowships awarded by the Graduate School. To be eligible for these competitive fellowships, application must be received by January 1. A varying number of teaching assistantships are awarded annually to qualified graduate students. Duties involve instructing German at the elementary or intermediate level. The department recommends those receiving assistantships for special tuition awards, including remission of out-of-state tuition.

To receive priority consideration for such departmental financial aid, applications must be received by January 31.

The duration of financial aid is usually two years at the master's level and three to four years at the doctoral level. However, reappointment and continuation of support depend critically on satisfactory academic progress and performance of duties (where applicable).

Graduate students are also encouraged to apply for external fellowships (Fulbright, DAAD) that will enable them to spend a year in residence at a German university. The Graduate School offers dissertation fellowships on a competitive basis to support dissertation research both on- and off-campus.

Mannheim Exchange

Each year, the department selects one Ph.D. student to go to Mannheim, Germany, to take part in an educational and teaching exchange program. A graduate student from Mannheim spends the year here, studying at UNC-Chapel Hill, teaching in the department, and acting as the resident assistant for the German Haus.

Publications

Since 1949 the department has published a monograph series, The University of North Carolina Studies in the Germanic Languages and Literatures, in collaboration with the University of North Carolina Press. In more than one hundred volumes to date, the results of research in a wide range of specialties in Germanic studies are made available to an international community of scholars.

Library and Research Facilities

The University library has outstanding holdings in German literature, Germanic linguistics, literary theory, and general linguistics, with further materials available from nearby Duke University (especially valuable for the Jantz Collection of Baroque Literature and German-American). A good collection of basic reference works and standard editions is available to students in the department reading room. The language laboratory has not only instructional tapes but also much other recorded material such as German plays, songs, and dialect recordings.

Courses without Credit for Graduate Students

101X, 102X ELEMENTARY GERMAN FOR GRADUATE STUDENTS (3).

Designed as preparation for the reading knowledge examination for higher degrees. Passing of the examination at the end of 102X certifies that this requirement has
been satisfied, although the course does not count for graduate credit. Three hours a week. Fall and spring. (NOTE: 101X or permission of instructor is required as a prerequisite for 102X.)

Courses for Graduates and Advanced Undergraduates

*Courses numbered 115-140 may be taken for three credit hours (final examination required) or students may concurrently enroll in an Essay (E) section (115E-140E, respectively) for an additional one credit hour. The four-credit-hour option requires a term paper and is available to German Department graduate students only.

100 ADVANCED GERMAN GRAMMAR (3). A study of current German structure and usage. This course strengthens the writing of graduate students and helps them confront the problems most frequently faced in speaking and teaching. Fall.

111 HISTORY OF GERMAN LITERATURE I (3). This course is the first part of a two-semester sequence offering students a comprehensive, text-based survey of German literary history from the High Middle Ages to the present.

112 HISTORY OF GERMAN LITERATURE II (3). This course is the second part of a two-semester sequence offering students a comprehensive, text-based survey of German literary history from the High Middle Ages to the present.

115* EARLY MODERN LITERATURE (3). German literature of the fifteenth, sixteenth, and seventeenth centuries. Close readings, lectures, and discussions of representative texts.

120* EIGHTEENTH-CENTURY LITERATURE (3). German literature in the Age of Enlightenment. Close readings, lectures, and discussions of representative texts.

125* EARLY NINETEENTH-CENTURY LITERATURE (3). German literature of the Romantic Period. Close readings, lectures, and discussions of representative texts.

130* LATER NINETEENTH-CENTURY LITERATURE (3). The literature of Realism, Naturalism, and related movements. Close readings, lectures, and discussions of representative texts.

135* EARLY TWENTIETH-CENTURY LITERATURE (3). Major figures of the period from the turn of the century to the Second World War. Close readings, lectures, and discussions of representative texts.

140* LATER TWENTIETH-CENTURY LITERATURE (3). Literature since World War II in the Federal Republic, the former GDR, Austria, and Switzerland. Close readings, lectures, and discussions of representative texts.

155 STYLISTICS: THEORY AND PRACTICE (3). A survey of stylistic theories and practices in literature and linguistics; analysis of a large variety of texts; written exercises; training in the use of stylistic devices.

160 HISTORY OF THE GERMAN LANGUAGE (3). Development of sounds and forms from ancient times to the present. Political, social, and literary forces influencing the language. Recommended for first semester of graduate study. Prerequisite: a good reading knowledge of German.

165 THE STRUCTURE OF MODERN GERMAN (3). Introduction to the formal analysis of German grammar (phonology, morphophonemics, prosodics, morphology, syntax) within the framework of generative grammar.

171 MIDDLE HIGH GERMAN (3). Introduction to medieval German language and literature.

172 PUDIGINS AND CREOLES (3). Examination of the linguistic features of pidgin and creole languages, the sociohistorical context of their development, and their impact on current theoretical issues (acquisition, universals, language change).

175 VARIATION IN GERMAN (3). A comprehensive account of major topics in German sociolinguistics: development of the German language, traditional dialects, variation in contemporary colloquial speech, German as a minority language (Alsatian, Belgium), German outside of Germany (Austria, Switzerland, Luxembourg).

180 PROBLEMS IN GERMANIC LINGUISTICS (3). Special problems will be selected for intensive investigation. The subject matter of the course will be adapted to the particular interests of the students and instructor.

Courses for Graduates

205 TEACHING METHODS AND MATERIALS (3). For prospective teachers of German. Required of all teaching assistants. Fall.

210 TOPICS IN MEDIEVAL LITERATURE (3).

215 TOPICS IN EARLY MODERN LITERATURE (3).

220 TOPICS IN EIGHTEENTH-CENTURY LITERATURE (3).

225 TOPICS IN EARLY NINETEENTH-CENTURY LITERATURE (3).

230 TOPICS IN LATER NINETEENTH-CENTURY LITERATURE (3).

235 TOPICS IN LATER TWENTIETH-CENTURY LITERATURE (3).

240 TOPICS IN LATER TWENTIETH-CENTURY LITERATURE (3).

245 TOPICS IN GERMAN CULTURAL STUDIES (3).

246 TOPICS IN GENDER STUDIES (3).

247 TOPICS IN GERMAN JEWISH STUDIES (3).

248 TOPICS IN GERMAN CINEMA (3).

250 TOPICS IN AESTHETICS AND CRITICISM (3).

255 GOTHIC (3). Reading and linguistic analysis of Gothic biblical texts, with study of phonology, morphology, and syntax; comparison with other older dialects of Germanic. (On demand.)

260 OLD NORSE I (OLD ICELANDIC) (3). Reading and linguistic analysis of Old Norse (Old Icelandic) texts, with study of phonology, morphology, and syntax; comparison with other older dialects of Germanic. (On demand.)

261 OLD NORSE II (OLD ICELANDIC) (3). Continuation of Old Norse I. (On demand.)

270 OLD HIGH GERMAN (3). Reading and linguistic analysis of Old High German texts, with study of phonology, morphology, and syntax; comparison of the various dialects with other older dialects of Germanic. (On demand.)

272 EARLY NEW HIGH GERMAN (3). Reading and linguistic analysis of Early New High German texts, with study of phonology, morphology, and syntax. (On demand.)

275 OLD SAXON (3). Reading and linguistic study of biblical texts (Heliand, Genesis) in Old Saxon, with study of phonology, morphology, and syntax; comparison with Old English, Old High German, and other Germanic dialects. (On demand.)

280 COMPARATIVE GERMANIC GRAMMAR (3). Analysis of phonological and morphological development from Indo-European to the older stages of Germanic dialects. Special attention to layering hypothesis, Benveniste root theory, and structure of nouns, pronouns, and verbs. Student presentations.

285 TOPICS IN GERMANIC LINGUISTICS (3).

299 INDEPENDENT READINGS (Var). Prerequisite, permission of instructor and director of graduate study. Special readings and research in a selected field or topic outside the scope of current course offerings.

345 SEMINAR IN GERMAN LITERATURE (3).

361 SEMINAR IN GERMANIC LINGUISTICS (3).

393 MASTER'S THESIS (Var).

394 DOCTORAL DISSERTATION (Var).
SCHOOL OF GOVERNMENT

MICHAEL R. SMITH, Dean

The mission of the School of Government is to improve the lives of North Carolinians by engaging in practical scholarship that helps public officials and citizens understand and improve state and local government.

The School of Government was established to advance innovative public service and engagement at the University of North Carolina at Chapel Hill.

In establishing the school, the University recognized the Institute of Government's distinguished seventy-year history of practical scholarship for North Carolina state and local government by adopting its mission as the core of the new school. The work of the school's 50 full-time faculty and 65 professional and support staff members is highly practical and accessible while drawing on the complexity of their disciplines — law, finance, management, and public administration. The School of Government (www.iog.unc.edu) advances general understanding about government and shares that information with practitioners and other scholars. It also offers a program of courses leading to the Master of Public Administration (M.P.A.) degree.

MASTER OF PUBLIC ADMINISTRATION

DEGREE PROGRAM

DAVID AMMONS, Director

Professors
Stephen Alred (1) Public Personnel Law, Administrative Law
David N. Ammons (2) Local Government Productivity Improvement
A. John Vogt (6) Public Financial Management
Gordon P. Whisler (36) Public Management, Organizational Theory
Deil S. Wright (37) Intergovernmental Relations, Organizational Theory, Public Management

Associate Professors
Frady Bluestein, Local Government Law
Phillip Boyle, Leadership, Public Management, Public Policy
Michelle Hoyman, Economic Development, Labor and Employment Policy, Professional Labor Arbitration
David Owens (7) Environmental Law, Administrative Law
Richard Whisman, Public Law and Government, Public Policy

Assistant Professors
Maureen Berner, Federal Budget Policy and Process, Applied Statistical Methods
John B. Stephens, Dispute Resolution and Consensus Building

Lecturers
Gregory S. Allison, Accounting
Margaret Henderson, Non-profit Management
Cassandra Kircher, Communications
William C. Rivennark, Local Government Administration

Program Overview
The School of Government offers the Master of Public Administration (M.P.A.) degree. The highly ranked M.P.A. program is a two-year, full-time, fifty-four credit courses of study that produces outstanding leaders for local, state, and federal government agencies, as well as respected directors of nonprofit organizations. Up to twenty-five new students are accepted each year. The M.P.A. program is accredited by the National Association of Schools of Public Affairs and Administration.

The UNC-Chapel Hill M.P.A. program has produced many city and county managers, budget and finance directors, personnel directors, and other local government department heads and professional staff. At the federal level, alumni from this program serve as administrators and analysts in many different agencies, including the Office of Management and Budget, the Environmental Protection Agency, the Department of Health and Human Services, the Department of Labor, the Administrative Office of the Courts, and Senate and House Committee staffs. In state governments, alumni direct departments and serve in middle management and staff positions in policy planning, finance and management, personnel, water resources, health services, education, and other areas. In the nonprofit sector, M.P.A. alumni administer programs in the arts, in education, in economic development, and in human services.

The M.P.A. program has a long-standing commitment to public service education for women and members of historically underrepresented minority groups. Black and female graduates of the program now lead a variety of public agencies. Program faculty continue this commitment and especially encourage minority applicants. More information is available at www.mpa.unc.edu.

Admission Requirements
The M.P.A. program is open to individuals from differing backgrounds. A majority of past entrants into the program have had undergraduate majors in the social sciences, especially political science and economics, but applicants have been accepted with undergraduate majors in architecture, business administration, engineering, English, French, history, industrial relations, music, and many other fields.

Applicants with demonstrated and clear career interests in public service receive preference. A significant part of each class comes directly from full-time employment. Others enter immediately after receiving undergraduate or graduate degrees. Admission to the program is highly selective because of the large number of applicants and the program's small size. Undergraduates who are considering applying are encouraged to take courses in American government and politics, economics, statistics, psychology, and accounting, although not all of these areas are among the formal prerequisites for admission.

The requirements for admission are:
• A bachelor's degree;
• At least a B average in the undergraduate major and a generally strong academic record;
• A minimum of three semester hours credit in American government and politics and a minimum of three semester hours credit in economics;
• Submission of verbal and quantitative scores on the GRE;
• Submission of a one-page statement of career interest and personal goals;
• Three letters of recommendation;
• An oral interview with the M.P.A. Admissions Committee.

Admission to the program is made only for the fall semester (starting in August) of each year. Since nearly all admission decisions are made by late March, applications and all supporting materials should be submitted by January 1. However, applications are accepted through March 1. After a preliminary screening of applications, notifications are made concerning the oral interview. In most cases, letters of acceptance and financial awards will be sent by April 15.

Financial Aid
Financial aid is available for students with outstanding records. Research assistantships include stipends of $6,000 per academic year. These awards provide payment of tuition and health insurance. In return for this funding, students work as graduate research assistants during their time of study. Available M.P.A. scholarships include the following:
• John Gold Scholarship, granted annually by the North Carolina City and County Management Association;
• Bob House Fellowship, granted to a person desiring a career in local government, provided by gifts in memory of Mr. House;
• Howard Holly Scholarship, granted annually by the North Carolina Association of County Finance Officers;
• Hayman-Howard-Wright Scholarship, established by the UNC M.P.A. Alumni Association in honor of three outstanding M.P.A. faculty members;
• Paul Wager Scholarship, awarded in memory of Professor Wager, an eminent authority on local government;
• Preyer Family Scholarship, established by the L. Richardson Preyer family;
• Nanette V. Mengel Endowment Scholarships, awarded in memory of Dr. Mengel, who taught professional communication in the M.P.A. program.
• Additionally, student loans are available from the Insured Student Loan Program. Information about this program is available from the Office of Scholarships and Student Aid.

Course Work and Degree Requirements
A minimum of fifty-four semester hours of credit, a professional work experience, and a final oral examination are required for the M.P.A. The two years of study and work are designed to combine three essential components of professional development: (1) a rigorous core of education in the theory and practice of public management; (2) a choice of an in-depth elective specialization in the second year; and (3) a summer-long "professional work experience" (P.W.E.) in between the first and second years, in a position with substantive, real-world responsibilities.

Core course requirements are:
- Public Organization Theory and Behavior (3).
- Introductory Policy Evaluation Methods (3).
- Professional Communication (3).
- Politics of the Administrative Process (3).
- Public Management and Leadership (3).
- Methods for Policy Analysis and Evaluation (3).
- Public Personnel Law and Administration (3).
- Government Budgeting and Finance (3).
- Governmental and Not-For-Profit Accounting and Reporting (2).
- Public Policy Analysis (3).
- Managing Public Policy (3).
- Values and Ethical Perspectives on Public Policy (3).
- M.P.A. Professional Development Seminar I and II (2 each).

In addition to the common core, each student completes five elective courses (fifteen semester hours). Courses may be taken from Political Science, Planning, Law, Social Work, Public Policy, or other departments as approved by the director.

Professional Work Experience
A three-month, full-time assignment extends M.P.A. education into a work situation in a public agency. P.W.E.'s take place during the summer following the first nine months of full-time study on campus. The student receives an appropriate salary or stipend. Each student is responsible for securing his or her own position and for professional performance of the work assignment. The assistance of M.P.A. faculty and staff is an important part of this process. The M.P.A. program provides information and referral for suitable positions and conducts seminars on résumé writing, interviewing, and other job search skills. Faculty remain in close contact with students and their supervisors during this period, conducting at least one visit to the work site.

Courses
205 PUBLIC POLICY ANALYSIS (POLI 205) (PLCY 205) (3). The roles of expertise in policy discourse; the place of values in policy analysis; summarizing preferences, benefits and costs; policy models; policy expertise and democratic political systems. Fall. Whitman.

210 PUBLIC ORGANIZATION THEORY AND BEHAVIOR (PLCY 210) (3). Exposition, comparison, and case-based application(s) of basic models of organizations, with emphasis on public sector entities. Fall. Whitaker.

211 PUBLIC MANAGEMENT AND LEADERSHIP (POLI 211) (PLCY 211) (3). Prerequisite, PADM 210. Development of administrators' skills in working with others to accomplish organization goals. Conceptual and experimental modes of learning used to examine a variety of administrative behaviors. Spring. Whitaker.

212 INTRODUCTORY POLICY EVALUATION METHODS (POLI 212) (PLCY 212) (3). The application of statistical methods to problems of evaluation of public programs and problems facing public managers. Theory and basic techniques up to an introduction of linear regression analysis. Fall. Berner.

213 MANAGING PUBLIC POLICY (POLI 213) (3). Prerequisites, POLI 210, 211, 212, 214, 226. The role(s), function(s), and strategy of public administrators in the formulation, adoption, and implementation of public policies. Policy from the perspective of the policy maker; cases exploring the relationship of theories to actual policy processes. Spring. Wright.

214 GOVERNMENT BUDGETING AND FINANCE (3). An introduction to the revenue and expenditure structure of the public sector including revenue policy, expenditure policy, and budget structure and administration. Topics are examined from an applied perspective using analytic criteria from public sector economics, public administration, and political science. Spring. Rivenbark.

215 NONPROFIT MANAGEMENT (3). Examination of the managerial challenges posed by nonprofit organizations and of techniques and practices used by managers of nonprofit organizations. Fall. Henderson.

216 LOCAL GOVERNMENT LAW (3). Overview of key legal concepts affecting local government operations. Topics include relation to federal/state governments, legal structures, finance and regulatory powers, plus introduction to the legal system and analysis. Spring. Bluestein.

217 M.P.A. PROFESSIONAL DEVELOPMENT SEMINAR I (POLI 217) (2). Integration of learnings from M.P.A. students' professional field experience ("internship") through site visits, conferences, and seminars. Fall. Ammons.

218 M.P.A. PROFESSIONAL DEVELOPMENT SEMINAR II (POLI 218) (2). Continued integration of learnings from M.P.A. students' professional field experience ("internship") through site visits, conferences, and seminars. Spring. Ammons.

219 POLITICS OF THE ADMINISTRATIVE PROCESS (POLI 219) (3). The motivations of public agency officials, interactions between bureaucracies and other political actors, and alternative strategies to control bureaucratic power and discretion is in making, implementing, and evaluating public policies. Fall. Boyle, Hoyman.


222 BUDGET PLANNING AND FINANCIAL MANAGEMENT (3). Prerequisite, PADM 214. Analysis of alternative approaches to planning and administering the budgets and financial operations of public agencies. Extensive use of case materials. Fall. Vegi.

223 ADMINISTRATIVE LAW DEVELOPMENT AND APPLICATIONS (3). Addresses legal issues in the exercise of governmental power by federal, state, and local agencies in the United States. Topics include legislative and executive oversight, rule making, adjudication, and judicial review. Fall. Owens.
224 PRODUCTIVITY AND IMPROVEMENT IN LOCAL GOVERNMENT (3). This course will acquaint students with the concept of productivity, its importance in the public sector, principal techniques used to improve productivity in local government, and barriers to productivity improvement initiatives. Fall. Affr. Ammons.

225 CITY AND COUNTY MANAGEMENT (3). Nature of city or county manager's job: expectations of elected body, staff, public and professional peers. Examines contemporary issues in departmental operations that have significant effect on how manager's performance is perceived. Fall. Staff.


233 GOVERNMENTAL AND NOT-FOR-PROFIT ACCOUNTING AND REPORTING (2). Teaches the principles of accounting and financial reporting in governmental and not-for-profit environment. Provides skills for analyzing the financial condition of governments and the efficiency and effectiveness of governmental programs. Spring. Allison.

234 PROFESSIONAL COMMUNICATIONS (3). Grounds students in fundamental techniques of writing and oral presentation in a range of formats suited to public service. Fall. Kircher.


237 METHODS FOR POLICY ANALYSIS AND EVALUATION (POLI 237, PLCY 237) (3). Prerequisite, Public Administration 212, Planning 130 or equivalent. Introduction to selected techniques such as the following: multiple regression, decision theory, research design, social experiments and quasi-experiments, program evaluation, and policy-related models. Spring. Bemer.

238 INTERGOVERNMENTAL RELATIONS (POLI 238) (3). Examines conflict and cooperation among governmental officials representing national, state, and local government in the United States; changing roles of governments; and new mechanisms for intergovernmental collaboration. Fall. Wright.

240 SPECIAL TOPICS IN PUBLIC ADMINISTRATION (3). Prerequisite, permission of the instructor. Seminar in selected area of public administration. Topics will vary from year to year. May be repeated for credit. Fall, spring. Staff.

241 DIRECTED READINGS IN PUBLIC ADMINISTRATION (1-3). Directed readings in a special field under the direction of a member of the graduate faculty. Fall, spring. Staff.

395 RESEARCH IN PUBLIC ADMINISTRATION (POLI 395) (0-6). Fall, spring, and summer. Staff.

702 FINANCIAL MANAGEMENT OF NONPROFIT ORGANIZATIONS (SOWO 702) (3). This course provides basic financial skills for leaders of nonprofits, including bookkeeping fundamentals, interpreting financial statements, budgeting, cash management and investment, and legal compliance. Fall. Staff.

Peter A. Coclanis (85) U.S. Economic and Business History, Colonial History
Peter G. Filene (83) Twentieth Century: American Social and Cultural History, U.S. Gender Roles
W. Miles Fletcher (52) Japanese History
Michael D. Green (74) Native American History
David M. Griffiths (62) Russia in the Eighteenth Century: Social and Intellectual, Marxism
Jacquelyn D. Hall (90) U.S. Women's History, Oral History, U.S. South
Barbara J. Harris (24) European Women's History (Especially Early Modern, Tudor-Stuart England)
R. Don Higginbotham (84) Colonial and Revolutionary America
Sylvia D. Hoffert (72) U.S. Women's History
Gerald C. Horne (76) African and African American History
Michael H. Hunt (97) U.S. Diplomatic History, U.S.-East Asian Relations, Chinese Foreign Relations
Konrad H. Jarausch (32) Nineteenth- and Twentieth-Century Europe
John F. Kasson (88) American Intellectual and Cultural History, Technology and Society, Art and Literature
Richard H. Kohn (82) Military History
Lloyd S. Kramer (39) European Intellectual History
Eugenia Lean (94) Modern China
Roger W. Lutchin (81) Urban Political History, 1800 to the Present
Genna Rae McNeil (86) African American History
Michael R. McVaugh (15) History of Science
Theda Perdue (95) Native American History
Louis A. Pérez, Jr. (66) Latin America, Caribbean, Cuba
Richard W. Pfaff (16) English Medieval History: Ecclesiastical, Cultural, and Political History
Donald J. Raleigh (64) Twentieth-Century Russian/Soviet History
Donald M. Reid (36) Modern French History
John E. Semonche (77) American Legal and Constitutional History
Richard A. Sadowsy (23) Nineteenth-Century Britain: Social, Intellectual, and Church History
Richard J. A. Talbert (18) Ancient Rome, Classics
Harry L. Watson (93) North Carolina History

Associate Professors
E. Willis Brooks (61) Russia in the Nineteenth Century: Social, Administrative, and Intellectual
John C. Chasteen (45) Latin America, Brazil
James L. Hevia (56) History of China
Reginald F. Hildebrand (75) African and African American Studies
James L. Leloudis (91) North Carolina History, U.S. South, Education History
W. James McCoy (17) Ancient, Particularly Greek History
Terence V. McIntosh (33) Early Modern European, Economic and Social
Sarah D. Shields (55) Islamic Civilization
Jay M. Smith (34) France 1550-1815

Assistant Professors
Kathryn J. Burton (47) Colonial Latin America
Jen W. Jackson (96) African American History
Lisa A. Lindsay (86) West Africa; African Diaspora
Yasmin Sukit (59) South Asia
Semi-Retired Professors
John M. Headley (31) Renaissance, Reformation, Seventeenth-Century Continental Europe
Lawrence D. Kessler (51) Chinese History: Seventeenth-Century Political and Social, Revolution and Experience since 1919, Modern U.S.-Chinese Relations
William E. Leuchtenburg (99) Recent American History
Joel R. Williamson (79) History of the South, Race Relations

DEPARTMENT OF HISTORY
PETER A. COCLANIS, Chair

Professors
Robert C. Allen (96) Media Studies
William L. Barney (92) The Political History of Nineteenth-Century America
Judith M. Bennett (37) European Women's History (Especially Medieval), Medieval England
Christopher R. Browning (30) Twentieth-Century Germany; the Holocaust
Melissa M. Bollard (38) Renaissance, Mediterranean and Early Modern Europe
Stanley Chojnacki (29) Late Medieval, Renaissance (Especially Italy and Venice), European Women's History
Professors Emeriti
Josef Andertle
Samuel H. Baron
Stephen B. Baxter
Frederick O. Behrends
Herbert L. Bodman Jr.
Henry C. Boren
Elisha P. Douglass
Frank W. Klingberg
Robert M. Miller
John K. Nelson
William S. Powell
Frank W. Ryan Jr.
George V. Taylor
George B. Tindall
Peter F. Walker
Gershon L. Weinberg

Graduate students in History develop both depth and breadth of historical knowledge. Each student works primarily within one of eight major fields: Ancient History; European History; History of Science; History of Women; Latin American History; Military History; Russian and East European History; and United States History. Students who advance to the doctoral level also develop expertise in a second field chosen from an even broader range of possibilities — that is, not only any of the above major fields but also African History, Middle-Eastern History, Asian History, and Global History.

Extensive information about the graduate program in History is available at www.unc.edu/depts/history/gradhome/, and the regulations that guide students progress can be seen at www.unc.edu/depts/history/gradhome/program.html. Please use these to supplement the brief summary below.

Admission
The department considers applications from those holding undergraduate degrees and those who have obtained M.A. degrees elsewhere. Students admitted to the department with an M.A. from another university will be reviewed by the faculty at the time of application to determine whether they should take second M.A. degrees here or proceed directly to Ph.D. training. Preference in admission is given to students who intend to proceed to doctoral work, either directly or after completion of the M.A. degree.

The M.A. Program
The courses required for the M.A. degree usually include an introduction to research (History 200) and introductory seminar (History 300), to be taken in the first year of study; a two-semester reading colloquium or its equivalent in the student’s major field; one additional seminar (300-level course); three hours of thesis credit (History 393); and four other courses, of which as many as three may be taken in fields other than that in which the student is concentrating or even in other disciplines. M.A. candidates must also pass a reading-knowledge examination in an appropriate foreign language, prepare an acceptable thesis, and pass an oral examination on the thesis. Students are expected to complete the M.A. after four semesters in residence.

The Ph.D. Program
Satisfactory completion of the M.A. does not automatically entitle a student to continue at the doctoral level. After the M.A. oral examination, the student’s committee reaches a formal written decision about whether he or she should continue toward the Ph.D.

All courses taken at UNC-Chapel Hill for the M.A. (except History 393) may be credited toward the doctoral program. If the Graduate School approves for transfer credit graduate courses taken elsewhere, these may be credited as well. Candidates for the Ph.D. complete the following minimum course program: (in addition to the requirements for the M.A.): research seminar; two courses in a second field of study; research design (History 393); and dissertation credit (History 394). A reading knowledge of two foreign languages is required for the Ph.D. degree.

Each doctoral student must pass written comprehensive examinations in the major field, as well as an oral examination that focuses on the dissertation. The final requirements for the Ph.D. are a dissertation and an oral examination on it.

The department expects doctoral students to proceed quickly with their work. For those pursuing both the M.A. and the Ph.D., all course work and the comprehensive written and oral examinations must be completed by the end of the seventh semester. For those who enter the program with an acceptable M.A. from another institution, A.B.D. status must be achieved within four semesters. The dissertation must be completed within a period of eight years.

Fellowships and Assistantships
The department funds most of its students through teaching assistantships or fellowships, and also offers research grants and dissertation fellowships. In addition, the Graduate School awards fellowships to both entering students and students in the later phases of their doctoral training. More details about funding for History students can be found at www.unc.edu/depts/history/gradhome/current/funding.html.

Libraries and Research Opportunities
The Davis and Wilson Libraries have many collections of great value, and the University itself is conveniently situated close to a number of other research centers, particularly the Duke University Library and the North Carolina State Department of Archives and History. The library houses many outstanding special collections, including the William Henry Hoyt Collection on revolutionary France and the Peabody Collection on international law and diplomacy. Especially notable are the Southern Historical Collection (one of the most important manuscript collections on the subject), and the North Carolina Collection (a repository of books, magazines, pamphlets, and newspapers published in or about North Carolina). The Southern Oral History Program and the Center for the Study of the American South further enhance research and training in the history of our region.

The University Center for International Studies, the Center for European Studies, and the Triangle Institute for Security Studies (TISS) sponsor fellowships, seminars, speakers, and other opportunities in their respective areas. The Ancient World Mapping Center forms part of the Department of History, and there is no other unit worldwide that matches its mission of promoting cartography and geographic information science within ancient studies. For research and other initiatives at the center, visit www.unc.edu/awmc. The department also sponsors the Project for Historical Education, an outreach program for teachers in secondary schools. In addition, a wide variety of workshops regularly bring together faculty and graduate students who share interest in particular historical topics or approaches.

Courses for Graduates and Advanced Undergraduates
100 SPECIAL TOPICS IN HISTORY (3). Instructors use this course to focus on particular topics or historical approaches. Specific course descriptions are available each semester on the departmental website (www.unc.edu/depts/history/).
101 ALEXANDER (3). The rise of Macedonia: the careers of Philip II and Alexander (with emphasis on the latter's campaign) and the emerging Hellenistic Age. The course integrates computer (including a website) and A-V materials throughout. Spring. McCoy.

102A ANCIENT GREEK WARFARE (PWAD 106) (3). War and the warrior in the archaic and classical Greek world, seventh through fourth centuries B.C. Spring. McCoy.

102B ANCIENT GREEK SOCIETY AND CULTURE (3). Topical approach to the social and cultural history of the ancient Greek city states. c. 800-336 B.C. History 52 strongly recommended. Summer. McCoy.

102C ANCIENT ATHENS (3). The life and times of the ancient Athenians from the 6th to 4th centuries B.C. History 52 strongly recommended. Fall. McCoy.

103 ROMAN HISTORY 154 B.C.-14 A.D. (3). Explores the transformation from Republic to Principate. Conducted in considerable part by student reports and classroom discussions. Talbert.


106 THE MEDIEVAL CHURCH (RELI 106) (3). The nature and workings of the Western church between roughly 600 and 1300. Emphasis on the church "from within": organization, missionary strategies, liturgy, monasticism, and popular religion. Pflug.

108 EUROPE IN THE HIGH MIDDLE AGES, 900-1300 (3). A survey of the political and institutional development of primarily Western Europe from late Carolingian times to the end of the thirteenth century. McVaugh.

110 THE MEDIEVAL UNIVERSITY (3). The origins and development of the university during the period 1100-1400: types of organization, curricula and degrees, intellectual life, town-grown and student-master relationships. McVaugh.

111 WOMEN AND MEN IN THE RENAISSANCE (3). Gender roles and relationships in Europe, 1350-1550: Renaissance state and domestic patriarchy; marriage, sexuality, and religious change; new ideas about sex and genders; economic change and domestic roles. Chojnacki.

112 THE RENAISSANCE (3). Italy, birthplace of the Renaissance, 1300-1550. A study of the people, culture, and intellectual achievements of the Italian Renaissance with emphasis on the interaction between culture and society. Bullard.

113 MEDITERRANEAN SOCIETIES AND ECONOMICS IN THE RENAISSANCE WORLD (3). A picture of Mediterranean social and economic life 1300-1600, with special focus on rural and urban society, family structure, patronage, work and wages, public and private finance. Bullard.


115 EUROPE IN THE SEVENTEENTH CENTURY (3). The century marks the watershed in the European development. Emphasizes: statecraft, the emerging statesystem, the new scientific worldview, the impact upon European society. Headley.

116 FRANCE IN THE AGE OF REASON (3). This course examines the Age of Enlightenment in France (1660-1787). The ideas of the 'philosophes' will be placed in a broad social, political, and international context. Smith.

117 THE FRENCH REVOLUTION, 1787-1815 (3). France’s rejection of traditional society and culture in the first 'modern' Revolution. Topics include royal absolutism, the Reign of Terror, popular violence, Napoleon, the language and ideology of revolution. Smith.

118 EUROPE, 1871-1918 (3). Emphasizes the disintegration of Europe, culminating in the First World War and the fall of the continental empires. Jarausch.

119 EUROPE SINCE 1918 (3). The main currents in European history since the first half of the twentieth century. Browning.

120A FRANCE: FROM JOAN OF ARC TO LOUIS XIV (3). This course covers the social, political, and cultural history of France from the later Middle Ages to 1715. Smith.

120B FRANCE FROM 1789 TO 1870 (3). The French people from the era of the Revolution to the Commune: cultural and social sources of political instability, the revolutionary tradition, liberal and conservative movements, and industrialization. Reid.

121 FRANCE SINCE 1870 (3). French society and culture from the Paris Commune of 1871 to the student revolt of May 1968. Reid.

122 GERMANY, 1815-1918 (3). The nature of Prussian society, the rivalry between Prussia and Austria for the command of German affairs, and the quality of Prussian leadership in the German Empire of 1871. Jarausch.

123 HISTORY OF GERMANY SINCE 1918 (3). Politics and culture in the Weimar Republic, Nazi totalitarianism, and the reshaping of East and West Germany since World War II. Browning, Jarausch.

124 HISTORY OF SPAIN (3). A survey of Spanish history from the Islamic invasion to Napoleon. Particular attention is given to the period of the Hapsburgs, 1516-1700. Headley, Burns.

125 INTELLECTUAL HISTORY OF EUROPE, EARLY PERIOD (3). The course examines the gradual erosion of criticism within the classical Christian tradition that led to the emergence of a new mentality by the end of the seventeenth century. Headley.

126 MODERN EUROPEAN INTELLECTUAL HISTORY (3). The main developments in European thought from the Enlightenment to the twentieth century, with some attention to social context. Readings include Voltaire, Rousseau, Hegel, Marx, Toqueville, Mill, Flaubert, Nietzsche, and Freud. Kramer.

127A SOCIETY AND FAMILY IN EARLY MODERN EUROPE (3). A survey of changes in urban and rural social structures, organization, family life, courtship practices, sexual behavior, and the relations between the economy and population that occurred in preindustrial Europe 1500-1815. McTinsh.

127B WAR AND SOCIETY IN EARLY MODERN EUROPE (PWAD 127B) (3). A critical examination, from the Renaissance to the Napoleonic period, of the changes in European land and naval warfare and their impact on society and government. McTinsh.

128 EUROPEAN SOCIAL HISTORY, 1815-1970 (3). The social transformation of Europe from agrarian through postindustrial society, discussing population growth, family history, spread of education, class structure, social conflict, group ideologies, and mass politics as well as everyday lives and popular lifestyles. Jarausch.

129 THE SCIENTIFIC REVOLUTION (3). Traces the creation of scientific thought 1500-1700, from Leonardo to Newton, examining the various strands - Greek science, art, engineering, experimentation, occultism, etc. - woven into it. McVaugh.

130 HISTORY OF SCIENCE FROM NEWTON TO EINSTEIN (3). A survey of the development since 1700 of the various branches of physical and biological science, culminating in the twentieth-century revolution in physics. McVaugh.

131 EARLY WESTERN MEDICINE (3). Shows how the age of Shakespeare and Newton (sixteenth-seventeenth century England) fused old and new ideas about medicine and health, anticipating some of our own beliefs and practices. McVaugh.

133 ENGLISH SOCIETY, 1200-1700 (3). This course examines critical issues in the development of English society and economy in the centuries before industrialization. Bennett.
134 MEDIEVAL ENGLAND (3). A consideration of England’s origins, unification, and development as a national monarchy. Primary emphasis is on political, ecclesiastical, and cultural aspects. Pfaff.

135 TUDOR AND STUART ENGLAND, 1485-1660 (3). A lecture course, open to juniors, seniors, and graduate students. Harris.

137 GREAT BRITAIN IN THE NINETEENTH CENTURY, 1815-1901 (3). Emphasizes the social and economic foundations of the political, intellectual, religious, and cultural history of Victorian Britain. Soloway.

138 GREAT BRITAIN IN THE TWENTIETH CENTURY (3). Explores the economic and social foundations of British political, intellectual, and cultural history from 1901 to the present. Soloway.

139 TECHNOLOGY AND IMPERIALISM (3). Comparative cultural history of Euro-American empire building in the nineteenth and twentieth centuries focusing on technological change, public displays, popular entertainment, and encounters between colonizer and colonized. Hevia.

140 IMPERIALISM AND THE THIRD WORLD (3). This course explores the processes by which nineteenth-century imperialism set the contours of the modern world, establishing relations among societies and reconfiguring both colonial cultures and European cultures. Lindsay.

141 MUSEUMS, MONUMENTS, AND COLLECTIVE MEMORY IN THE MODERN ERA (INTS 132, ART 132) (3). This course explores the relation between museums and monuments, historically and theoretically, and relates them to national and international developments in the nineteenth and twentieth centuries. Hevia.

143 HISTORY OF SOCIALIST THOUGHT (3). An examination of the origins and development of Marxist ideas, and their application to specific historical conditions in Germany, Russia, China, Algeria, Cuba, and modern industrial society. Griffiths.

145 THE AMERICAN COLONIAL EXPERIENCE (3). Major topics: European reconnaissance; founding of new societies; character and structure of institutions; thought and feeling from Cotton to Franklin; privilege and cost of empire. Higginbotham.

146 REVOLUTION AND NATION-MAKING IN AMERICA, 1763-1815 (PWAD 146) (3). Major topics: constitutional conflict in the British empire; independence and war; the Constitution; growth of political parties and nationalities in a period of domestic change and international conflict. Higginbotham.

147 JACKSONIAN AMERICA, 1815-1848 (3). The society and politics of the United States during the period dominated by President Andrew Jackson. Topics include economic development, the expansion of slavery, religion and reform, the changing roles of women, and the political movements associated with "Jacksonian democracy." Watson.

148 CIVIL WAR AND RECONSTRUCTION, 1861-1877 (PWAD 148) (3). Focus is on the causes, nature, and consequences of the Civil War. Barney.

150 UNITED STATES HISTORY SINCE 1945 (3). Diverse developments as interpreted within the framework of certain broad and open-ended themes: particularly, individual freedom, social welfare, mass culture, and community. Filene.

151A THE ETHNOHISTORY OF NATIVE AMERICAN WOMEN (WMST 151A) (3). Introduces students to the study of Native American women through the perspectives of anthropology, history, and autobiography. Perdue.

152 U.S. FOREIGN RELATIONS IN THE TWENTIETH CENTURY (PWAD 152) (3). How the United States came to occupy a leading role in world affairs as a diplomatic, military, economic, and cultural power and what that role has meant to Americans and to other peoples, especially during the Cold War. Hunt.

153A THE VIETNAM WAR (PWAD 117 and ASIA 153) (3). A wide-ranging exploration of America’s longest war – from nineteenth-century origins to 1990s legacies, from village battlegrounds to the Cold War context, from national leadership to popular participation and impact. Hunt.

154 INTELLECTUAL AND CULTURAL HISTORY OF THE UNITED STATES, 1630-1860 (3). A survey of early American philosophical, religious, social, political, and aesthetic thought, with an emphasis on leading figures and movements from Puritanism and the Enlightenment to evangelicalism and Romanticism.

155 INTELLECTUAL AND CULTURAL HISTORY OF THE UNITED STATES, 1865 TO PRESENT (3). A survey of American philosophical, religious, social, political, and cultural thought, with an emphasis on leading figures and movements from Darwinism and pragmatism to modernism and postmodernism.

156 POPULAR CULTURE AND AMERICAN HISTORY (3). Study of the popular arts and entertainments of the nineteenth and twentieth centuries and the ways in which they illuminate the values, assumptions, aspirations, and fears of American society. Kassen.

157 AMERICAN CONSTITUTIONAL HISTORY TO 1876 (3). In a classroom environment characterized by discussion, simulation, and interaction, the antecedents, formation, and interpretation of the Constitution are confronted in a broad historical matrix. Semencie.

158 AMERICAN CONSTITUTIONAL HISTORY SINCE 1876 (3). Utilizing a classroom environment similar to 157, constitutional adjustments and change are related to psychological, political, social, and economic factors and Supreme Court members. Semencie.

159 PUBLIC RELIGION IN U.S. HISTORY ( RELI 159) (3). Prerequisite, introductory History or Religious Studies course. A study of public religion in United States history including the relations of religion and government, the idea of American exceptionalism and destiny, and the role of religious movements. Mathews.

160 WOMEN AND RELIGION IN U.S. HISTORY (WMST 160) (3). Prerequisites are introductory courses in religious or women’s studies or U.S. history. An interdisciplinary consideration of women’s roles, behavior, and ideas in the religious life of Americans from 1626 to 1982. Mathews.

161 TECHNOLOGY AND AMERICAN CULTURE (3). Technology’s impact on American thought and society and the response it has engendered. Topics include: the factory town; search for utopia; impact of Henry Ford; war and de-personalization. Kassen.


163 THE OLD SOUTH (3). Economic, cultural, and social history of the antebellum South. The region’s political history serves as a supporting part of the study. Watson.

164 THE SOUTH SINCE RECONSTRUCTION (3). A survey of the South during the past one hundred years, covering developments in politics, economics, culture, and society. Course begins at the end of Reconstruction.

166 HISTORY OF AFRICAN AMERICANS, 1865 TO PRESENT (3). Examination of role of Blacks in U.S. history after 1865. Focus on Black sub-culture. Analysis of theories about the Black experience in America.

167 WHITE CULTURE AND RACE RELATIONS IN THE SOUTH (3). This course describes and analyzes the evolution of southern white culture with emphasis on the years since 1831, and describes it as the result of the black presence. J. Williamson.

168 WOMEN IN THE SOUTH (WMST 168) (3). An exploration of the distinctive themes in southern women’s lives, using the evidence of history and literature. Hall.
169 AFRICAN AMERICAN WOMEN'S HISTORY (WMST 169, AFAM 169) (3). This course covers the history of black women in United States history from the eighteenth century to the present. It deals with such themes as work, family, community, sexuality, politics, religion, and culture. Jackson.

170 INTRODUCTION TO ORAL HISTORY (FOLK 174) (3). Introduces students to the uses of interviews in historical research. Questions of ethics, interpretation, and the construction of memory will be explored, and interviewing skills will be developed through field work. Hall.

171 RELIGIOUS HISTORY OF THE SOUTH (3). A historical analysis of the religious life of southerners from the Great Awakening to the present with an emphasis on how religion, social institutions, and cultural practices intersect. History 21 or 22 or Religious Studies 29 recommended. Mathews.

172 MEDICINE AND SOCIETY IN AMERICA (3). A survey of major developments in the history of American medicine. Emphasis is placed upon setting the practice of medicine as well as the experience of health and disease into broad social, cultural, and political contexts. Hall.

173 ORAL HISTORY AND PERFORMANCE (COMM 173, WMST 173) (3). This course combines readings and field work in oral history with study of performance as a means of interpreting and conveying oral history texts. Emphasis on women's history. Hall.

175 HISTORY OF MEXICO (3). Topical approach to the history of Mexico, from pre-Columbian civilizations through the Spanish conquest and colonial system. Emphasis will be given to the nineteenth and twentieth centuries. Pérez.

176A HISTORY OF THE CARIBBEAN (3). This course is organized around a thematic approach to the history of the West Indies, with emphasis on the period from European conquest through the twentieth century. Topics include colonialism, slavery, monoculture, United States-Caribbean relations, and decolonization. Pérez.

176B HISTORY OF CUBA (3). Thematic approach to Cuban history from conquest to the revolution. Attention is given to socioeconomic developments, slavery and race relations, the nineteenth-century independence process, and the twentieth-century republic. Pérez.

177 HISTORY OF BRAZIL (3). This course is concerned primarily with the creation of a new society through race mixture and culture change, and with the political and economic development of Brazil. Chasteen.

180 THE AFRICAN DIASPORA (3). A comparative examination of the movements, experiences, and contributions of Africans and people of African descent from the period of the Atlantic slave trade to the present. Lindsay.


182 WOMEN AND GENDER IN AFRICAN HISTORY (AFRI 182) (3). Analysis of historical transformations in Africa and their effects on women's lives and gender relations. Particular themes include precolonial societies, colonialism, religious change, urban labor, nationalism, and sexuality. Lindsay.

184 RUSSIA AND THE WEST IN THE EIGHTEENTH CENTURY (3). A comparative approach, centering on Russia's contacts with the West, the resulting interaction, and the efforts of Russians to define the unique nature of their own society. Griffiths.

185 RUSSIA, 1796-1917 (3). The diplomatic, military, and ideological confrontations with the West; the decline and fall of the Russian autocracy; the evolution of reform thought and revolutionary opposition. Brooks.

186A REVOLUTION IN RUSSIA, 1900-1930 (3). A close study of Russia's age of revolution from the reign of the last czar to the turbulent Stalin Revolution of 1929, with emphasis on the revolutions of 1917. Raleigh.


190 EASTERN EUROPE SINCE WWI (3). An examination of the countries of Eastern Europe, their origins and development since World War II, their cohesion and conflict. Shields.

195A WOMEN IN THE MIDDLE EAST (3). This course explores the lives of women in the Middle East and how they have changed over time. Focus changes each year. Shields.

196 REVOLUTION IN THE MODERN MIDDLE EAST (3). This course focuses on revolutionary change in the Middle East during the last century, emphasizing internal social, economic, and political conditions as well as international contexts. Shields.

Courses for Graduates

200 INTRODUCTION TO HISTORICAL METHODS AND RESEARCH (3). Introduction to research. Required for all first-year students. Fall.

201 INTRODUCTION TO MEDIEVAL STUDIES (3). This is an interdisciplinary course to introduce graduate students to the sources, methods, and approaches of Medieval Studies.

202 INTRODUCTION TO HISTORICAL EDUCATION (3). Provides an introduction to teaching history. Topics include the history of historical education, planning a course, the role of the teacher, goals and methods, using new technologies, and evaluating students. Spring. Filene, Shields.

203A INTRODUCTORY COLLOQUIUM ON EARLY MODERN EUROPE (3). Directed readings on early European history, from Britain through European Russia. Fall. (Alternate years.)

203B INTRODUCTORY COLLOQUIUM ON MODERN EUROPE (3). Directed readings on modern European history, from Britain through European Russia. Spring.

204 READINGS IN RUSSIAN AND EAST EUROPEAN HISTORY. A sequence of four courses on the several periods and the main themes of Russian and Soviet History. Brooks, Griffis, Raleigh.

204A READINGS IN RUSSIAN HISTORY BEFORE 1796 (3). Griffis.

204B READINGS IN RUSSIAN HISTORY, 1796-1917 (3). Brooks.

204C READINGS IN SOVIET HISTORY (3). Raleigh.

204D SPECIAL TOPICS IN RUSSIAN AND EAST EUROPEAN HISTORY (3).

205A READINGS IN EUROPEAN EXPANSION AND GLOBAL INTERACTION, 1400-1800 (3). Examines the dynamics of cross cultural contacts and exchange between Europe and other civilizations in the context of a growing global interconnectedness. Spring. (Alternate years.)

205B READINGS IN CONTEMPORARY GLOBAL HISTORY (3). Focus on the nineteenth and twentieth centuries. Mixing theory, case studies, and comparisons, readings reflect disciplinary diversity. Fall.

206 PROBLEMS IN GREEK HISTORY, 600-323 B.C. (3). Prerequisite, consent of the instructor. McCoy.

207A INTRODUCTORY COLLOQUIUM IN LATIN AMERICAN HISTORY BEFORE 1810 (3). Directed readings on Latin American history from pre-conquest to 1810; required for students entering the field. Fall. Burns.


208 HISTORY OF ROME, 27 B.C.-180 A.D. Talbert.
209A INTRODUCTORY COLLOQUIUM IN UNITED STATES HISTORY TO 1865 (3). Directed readings on American History through the Civil War; required for students entering the field. Fall.

209B INTRODUCTORY COLLOQUIUM IN UNITED STATES HISTORY SINCE 1865 (3). Directed readings on American history from the Civil War to the present; required for students entering the field. Spring.

210 READINGS IN EAST EUROPEAN HISTORY (3). Directed readings on modern East European history.


217 READINGS IN URBAN HISTORY (3). A readings course to introduce students to the major topics in urban history. Lechten.

218 READINGS IN THE HISTORY OF GENDER AND SEXUALITY (WMST 218) (3). Prerequisite, graduate standing. Readings on the historical study of gender and sexuality and on definitions of femininity and masculinity in different historical contexts. Fall, spring. Hoffert, Chojnacki.


220 READINGS IN MODERN EUROPEAN WOMEN'S HISTORY (WMST 220) (3). A readings course in the history of women in Europe since 1500. Bennett, Harris.

221 READINGS IN AMERICAN WOMEN'S HISTORY (WMST 221) (3). A readings course on the history of women in the United States. Hall, Hoffert.

222 SELECTED TOPICS IN THE COMPARATIVE OR GLOBAL HISTORY OF WOMEN (WMST 222) (3). Depending on instructor, this course is taught as comparative history (subjects examined in different contexts) or global history (subjects placed in global context). Spring. (Alternate years with History 228.)

223 READINGS IN MEDIEVAL WOMEN'S HISTORY (WMST 223). A readings course on the history of women, gender, and sexuality in Medieval Europe. Bennett.

225 COLLOQUIUM IN WORLD MILITARY HISTORY (3). Reading colloquium in world military history, emphasizing Europe, focusing on the most significant issues, methods, and approaches in the field today. Kahn.


227 READINGS IN EARLY MODERN EUROPEAN HISTORY (3). Bullard.

228 FEMINIST THEORY FOR HISTORIANS (WMST 228) (3). Readings in contemporary feminist theory, focused especially on theories that address the construction, writing, and general practice of history. Spring. (Alternate years with History 222.)

229 READINGS IN THE HISTORY OF SCIENCE AND MEDICINE (3). Examines the principal historiographical problems in the history of science and medicine, focusing on a different topic each year. McVaugh.

230 EARLY MODERN GERMANY (3). A topical survey of the political, social, and economic history of early modern Germany. McIntosh.

231 TOPICS IN FRENCH HISTORY (3). This course examines one period or one set of problems within French history since the Renaissance. Topics determined by instructor. Open to graduate students from all departments. Kramer, Reid, Smith.


234 TOPICS IN MODERN EUROPEAN HISTORY (3). Jarausch.

235 READINGS IN EUROPEAN SOCIAL HISTORY (3). Reid.

236 READINGS IN MODERN EUROPEAN HISTORY, 1918-1945 (3). Browning.


239 MEDIEVAL ENGLAND (3). Prerequisite, History 137 or equivalent. Pfaff.

240 STUDIES IN MODERN ENGLISH HISTORY (3). Directed readings in nineteenth- and twentieth-century English history. Topics vary from year to year. Solowy.

243 LATE MEDIEVAL ENGLAND (3). Prerequisite, History 133, 134, or equivalent. Readings in English history, ca. 1300-1500, with a focus on social, economic, political, and legal topics. Bennett.

244 HISTORY OF U.S. FOREIGN RELATIONS (3). Hunt.


246 TOPICS IN AMERICAN INTELLECTUAL HISTORY (3). Readings and discussions on selected topics in the history of American thought and intellectual culture.

248 READINGS IN NATIVE AMERICAN HISTORY (AMST 248) (3). Readings in and discussions of the major works in Native American history. Perdue, Green.

249 READINGS IN EARLY AMERICAN HISTORY (3).

250 THE AMERICAN REVOLUTIONARY ERA, 1763-1789 (3). Higginbotham.

251 THE UNITED STATES IN THE FEDERAL PERIOD, 1789-1820 (3). Readings, discussion, and book lists designed to give familiarity with the historiographical problems, research opportunities, and bibliography of the period. Higginbotham.

252 THE UNITED STATES IN THE MIDDLE PERIOD, 1815-1860 (3). An analysis of the material and ideological transformations within the antebellum republic, which climaxed in the sectional crisis of the 1850s. Barney.

254 CIVIL WAR AND RECONSTRUCTION, 1860-1876 (3). Barney.

256 RECENT AND CONTEMPORARY UNITED STATES (3).

259 POLITICAL AND SOCIAL HISTORY OF MODERN AMERICA (3). A course of readings for advanced students that relate social history to the history of the state in America in the period from the Great Depression and the New Deal to the present.

261 INTRODUCTION TO MILITARY HISTORY (3). An introduction to the methods, issues, and literature of military history, including classic works and scholarship representative of a variety of approaches from history and other disciplines. Fall. Kahn.

262 COLLOQUIUM IN UNITED STATES MILITARY HISTORY (3). Reading colloquium in United States military history focusing on the most significant issues, methods, and approaches in the field today. Kahn.

263 READINGS IN THE ANTEBELLUM SOUTH (3). A review of traditional and modern literature on the pre-Civil War South, focusing on the interrelationships of its economy, society, culture, and politics. Watson.

264 READINGS IN THE SOUTH SINCE RECONSTRUCTION (3). Readings, reports, and discussions on selected topics with a view to gaining familiarity with the literature of the field. Leolaia.
265 READINGS IN AFRICAN AMERICAN HISTORY (3). Graduate students compile bibliographies and read important contributions to various aspects of African American history, stressing shifts in African American historiography and including very recent works.

269 TOPICS IN AMERICAN CULTURAL HISTORY (3). Kasson.

270 PROBLEMS IN LATIN AMERICAN HISTORY (3). Burns, Chasteen, Pérez.

281 TOPICS IN FILM AND MEDIA HISTORY (3). Varying in specific focus and period from term to term, this course considers both the rise of film and electronic media as an historical phenomenon and the ways in which film and media texts might be employed as evidence in the writing of history. Allen.

290 TOPICS IN HISTORY FOR GRADUATES (3). Instructors use this course to focus on particular topics or historical approaches. Specific course descriptions are available each semester on the departmental website (www.unc.edu/depts/history).

299 INDEPENDENT STUDY FOR GRADUATE STUDENTS (3). Independent reading programs for graduate students whose needs are covered by no course immediately available. Consent of the instructor required. For students resident in Chapel Hill or vicinity.

300 GRADUATE STUDIES IN HISTORY: SECOND COURSE (3). Application of research skills to historical investigation. Required for all first-year students. Spring.

301 ANCIENT HISTORY (3).

311 MEDIEVAL HISTORY (3).

319 SEMINAR IN EARLY MODERN EUROPEAN HISTORY (3).

324 SEMINAR IN MODERN EUROPEAN HISTORY (3).

325 SEMINAR IN RUSSIAN AND EAST EUROPEAN HISTORY (3).

330 SEMINAR IN U.S. HISTORY (3).

342 SEMINAR IN AFRICAN AMERICAN HISTORY (3).

348 RESEARCH IN NATIVE AMERICAN HISTORY (AMST 348) (3).

350 SEMINAR IN THE HISTORY OF SCIENCE (3).

361A INTRODUCTORY SEMINAR IN MILITARY HISTORY (3).

361B ADVANCED SEMINAR IN MILITARY HISTORY (3).

371 SEMINAR IN LATIN AMERICAN HISTORY (3).

387 SEMINAR ON WOMEN'S HISTORY (WMST 387) (3).

390 SEMINAR IN HISTORY (3). Given on demand and as resources permit, this seminar allows faculty to respond to student interest in particular topics. Fall.

391 M.A. RESEARCH SEMINAR (3). A seminar for those preparing the M.A. thesis. Pursuing original research in primary sources, students prepare full drafts of their theses. Fall.

392 Ph.D. RESEARCH SEMINAR (3). A research seminar for students beyond the M.A. but not yet A.B.D. Spring.

393 MASTER'S THESIS (3 or more). Individual work on the M.A. thesis, pursued under the supervision of the M.A. advisor.

394A DOCTORAL DISSERTATION (3 or more). Individual work on the doctoral dissertation, pursued under the supervision of the Ph.D. advisor.

394B DISSERTATION SEMINAR (3). A seminar for A.B.D. students, offered as demand and resources permit.

399 HISTORICAL EXPLORATION AND RESEARCH DESIGN (3). Required of all doctoral candidates in the last semester of course work, this practicum helps students refine a dissertation topic and produce a prospectus. Fall.

HUMAN MOVEMENT SCIENCE
CAROL A. GIULIANI, Curriculum Director

Professors
Michael T. Gross (29) Biomechanics, Sports Medicine, Orthopedics, Orthotics
Carol A. Giuliani (28) Neural Basis of Motor Control, Disability in Aging, Stroke Recovery, Movement Analysis
Anthony C. Hackney (21) Exercise Physiology, Metabolism, Endocrinology
Henry S. Hsiao (03) Medical Instrumentation, Interfaces, Microprocessors to Physiological Transducers, Telemedicine
Carol L. Lucas (01) Digital Signal Processing, Mathematical Modeling and Simulation, Pulmonary Circulation in Newborns and Infants
Robert G. McMurry (13) Physiology of Exercise Disease, Energy Expenditure of Children
Frederick O. Mueller (07) Epidemiology of Athletic Injuries. Administration, Sports Medicine
William E. Prentice (15) Athletic Training, Sports Medicine
John M. Silva (17) Sports Psychology
William Garrett, Orthopedics and Sports Medicine
Darin Padua, Biomechanics and Sports Medicine
Richard G. Mynark, Motor Control, Motor Learning, Aging, and Statistics

Associate Professors
Jan Busby-Whitehead (08) Geriatric Medicine
Carol Hogue (65) Frail Elderly, Quality of Life in Old Age
Michael Y. Lee (04) Neurological Rehabilitation, Clinical Neurophysiology, Acupuncture
Philip L. Witt (22) Ergonomics Intervention, Research Design, Orthopedics, Spinal Dysfunction
Kevin M. Guskiewicz (24) Athletic Training, Anatomy

Assistant Professors
Janet K. Freburger (45) Health Sciences Research, Research Design, Biomechanics, Orthopedics
Bonita Marks (26) Exercise Physiology
Vicki S. Mercer (40) Motor Control, Motor Learning, Posture and Balance across the Lifespan
Paul W. Tawney (06) Spinal Cord Injury, Back Pain, Vestibular and Balance Disorders, Post-Polio
Debbie E. Thorpe (44) Pediatrics, Motor Learning, Developmental Disabilities, Aquatics
Bing Yu (43) Biomechanics, Rehabilitation, Movement Analysis

Research Assistant Professors
Kathy Tawney (05) Applied Physiology, Physical Activity and Aging, Rehabilitation Intervention
Paul S. Weinhold (02) Biomechanics of Repetitive Motion Injury, Tissue Engineering

Clinical Associate Professors
Marie A. Reilly (35) Early Human Behavior and Development, Behavioral Motor Control, Developmental Disabilities
Darlene K. Sekerak (25) Pediatrics, Health Policy, Research Utilization

Instructor
Angela Rosenberg, Pediatrics and Community Resources

Program Description: Doctor of Philosophy
The Department of Allied Health Sciences in the School of Medicine offers an interdisciplinary program of study in Human Movement Science leading to the Doctor of Philosophy degree. The intent of this program is to develop research and teaching scholars who are capable of producing and disseminating new knowledge in the field of Human Movement Science.
(A Master of Science degree in Human Movement Science, designed for physical therapists and graduates in related fields, is a separate program which is offered by the Division of Physical Therapy. Please refer to the departmental listing for Physical Therapy for information about that program.)

The Doctoral Program in Human Movement Science is offered with the cooperative effort of the following departments at UNC-Chapel Hill: Allied Health Sciences-Division of Physical Therapy; Biomedical Engineering; Exercise and Sport Science; Orthopedics; Physical Medicine and Rehabilitation; and the Program on Aging. This program is designed to provide students an opportunity for doctoral study in areas that will increase our knowledge of human movement performance. The program focuses on contributing to the scientific basis of human movement, developing theory and methods for maintaining health, preventing disability, and improving movement ability. Focusing on normal movement and movement disability requires a special emphasis in research and education that draws upon yet differs from the focus of related sciences. Students of varied academic disciplines are accepted into the program. Students choose one of four tracks as a focus for their coursework and research experiences:
1. Behavioral (motor learning, motor development, and psychoenvironmental factors)
2. Biomechanics (musculoskeletal mechanics and external mechanical constraints)
3. Physiology (exercise response and training in nondisabled and special populations)
4. Neuromuscular control (motor control, neural and muscular aspects of movement, and modeling)

Program Requirements
The curriculum core requirements allow flexibility in designing programs of study to meet the needs of each track and the student’s interests. Among these requirements are the core courses HMSC 200 A and B: Scientific Basis of Human Movement. Degree requirements also include a qualifying written exam, a doctoral written exam, a preliminary oral exam, a dissertation defense, and a written dissertation. Other specific requirements will vary depending on the student’s background and program track.

Research Facilities
Several research facilities are available for students in the departments participating in the program. These include: the Orthopedic Biomechanics Laboratory in the Department of Orthopedics; the Functional Mobility, Motion Analysis, Motor Behavior, and Observational Studies Laboratories in the Division of Physical Therapy’s Center for Human Movement Science; and the Applied Physiology, Cardiac/Anatomy, and Sports Medicine Laboratories in the Department of Exercise and Sport Science. These laboratories are equipped with state-of-the-art instruments for measuring a wide range of human performance which includes behavioral, physiological, biomechanical, and computer modeling.

Admission
Student selection is based primarily on academic records and research experience. Requirements include the following:
1. A master's degree in a field related to human movement (e.g., physical therapy, exercise science, biomedical engineering, anatomy.)
2. A grade point average of B or better in the last two years of the student’s undergraduate program.
3. Graduate Record Examination (GRE) with minimum scores in the 50th percentile for both the verbal and quantitative sections, and TOEFL scores above 550 for international students, with a minimum score of 50 on all three sections.
4. Prerequisite courses:
   a. Introductory graduate-level statistics
   b. Human anatomy
   c. Human physiology
   d. Physics
   e. Chemistry
   f. Psychology
5. Because of the varied backgrounds of applicants, decisions on additional prerequisite preparation for each student will be decided by the Graduate Education Committee.
6. Three letters of academic recommendation.
7. Curriculum vitae.
8. Written statement of the academic/career goals and research interests.
   Applicants should indicate the name of the faculty member who has agreed to sponsor them.
9. Applicants must have a faculty sponsor. Applicants are strongly encouraged to contact a faculty member in their area of interest.

Courses
Course work appropriate for the student's area of interest may be taken from a wide range of departments. The courses listed here are examples, but are not meant to be inclusive. (Please refer to departmental listings for full course descriptions.)

Biomedical Engineering
BMME 106 SIGNALS AND SYSTEMS
BMME 111 INTRODUCTION TO BIOMEDICAL INSTRUMENTATION
BMME 112 BIOMATERIALS/BIOCOMPATIBILITY
BMME 120 REAL-TIME COMPUTER
BMME 121 DIGITAL SIGNAL PROCESSING
BMME 132 LINEAR CONTROL THEORY
BMME 160 FUNDAMENTALS OF MATERIALS ENGINEERING
BMME 232 DIGITAL CONTROL THEORY
BMME 260 MATERIALS ENGINEERING

Exercise and Sport Science
EXSS 230 MANAGEMENT OF ATHLETIC INJURIES
EXSS 232 GROSS ANATOMY FOR ATHLETIC TRAINERS
EXSS 235 SPORTS MEDICINE ANALYSIS: SPECIAL PROBLEMS RELATED TO SPORTS MEDICINE
EXSS 236 CLINICAL METHODS IN ATHLETIC TRAINING
EXSS 239 PRACTICUM IN ATHLETIC TRAINING
EXSS 251 SPORT PSYCHOLOGY
EXSS 252 APPLIED SPORT PSYCHOLOGY
EXSS 255 SOCIAL ISSUES IN PHYSICAL EDUCATION AND SPORT
EXSS 280 PHYSIOLOGY OF EXERCISE
EXSS 281 ADULT FITNESS/CARDIAC REHABILITATION
EXSS 282 NUTRITIONAL ASPECTS OF EXERCISE
EXSS 283 ASSESSMENT OF PHYSIOLOGICAL FUNCTION IN EXERCISE
EXSS 285 SEMINAR IN EXERCISE PHYSIOLOGY
EXSS 300 SPECIAL TOPICS IN EXERCISE AND SPORT SCIENCE
EXSS 320 RESEARCH IN EXERCISE AND SPORT SCIENCE

**Physical Therapy**
HMSC 170 ELECTRONICS FOR HUMAN MOVEMENT SCIENCE
HMSC 200A B SCIENTIFIC BASIS OF HUMAN MOTION
HMSC 210 MUSCLE MECHANICS AND ELECTROMYOGRAPHIC KINE- SIOLGY
HMSC 243 TOPICS IN MOTOR CONTROL AND MOTOR LEARNING: THERAPEUTIC IMPLICATIONS
HMSC 280 INTRODUCTION TO OUTCOMES RESEARCH IN HEALTH CARE
HMSC 282 INFANT AND FAMILY ASSESSMENT
HMSC 282L LABORATORY IN INFANT AND FAMILY ASSESSMENT
HMSC 290 ADVANCED KINESIOLOGY AND BIOMECHANICS
HMSC 291 ANALYSIS OF HUMAN MOTION
HMSC 301 SEMINAR IN HUMAN MOVEMENT SCIENCE
HMSC 303 PROBLEMS IN HUMAN MOVEMENT SCIENCE
HMSC 311 BASIC ASPECTS OF AGING (MEDI 485, DECO 486)
HMSC 377 INDEPENDENT STUDY IN HUMAN MOVEMENT SCIENCE
HMSC 379 RESEARCH IN HUMAN MOVEMENT SCIENCE
HMSC 381 THE NEURAL BASIS OF MOTOR CONTROL
HMSC 386 UNDERSTANDING RESEARCH
HMSC 387 DEVELOPMENTAL MOTOR CONTROL
HMSC 604 AGING AND HEALTH
HMSC 607 AGING AND PUBLIC POLICY
HMSC 611 MOVEMENT AND BALANCE IN AGING

**Interdisciplinary Human Movement Science**
IHMS 350 ISSUES IN MOTOR CONTROL AND MOTOR LEARNING
IHMS 370 DOCTORAL DEVELOPMENT SEMINAR
IHMS 394 DOCTORAL DISSERTATION

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**SCHOOL OF INFORMATION AND LIBRARY SCIENCE**

**Professors**

- Joanne Gard Marshall (Dean)
- Paul Solomon, Associate Dean

**Evelyn H. Daniel (30)** Information Resources Management, Organization Theory, Special Librarianship, School Librarianship, Distance Education, Management, Marketing, User Education

**Joe A. Hewitt (21)** Administration of Technical Services, Academic Librarianship, Management

**Robert M. Losee (40)** Information Retrieval, Information, Reasoning Systems, Decision Making

**Gary J. Marchionini (89)** Information Seeking in Electronic Environments, Human-Computer Interaction, Digital Libraries, Information Design and Information Policy

**Joanne Gard Marshall (90)** Health Information Needs and Services, Value and Impact of Library and Information Services, Information Technology and the Aging Workforce, Competencies of Library and Information Professionals

**Barbara B. Moran (30)** Academic Librarianship, Management of Information Agencies, Human Resources Management, Popular Materials, Organizational Design and Leadership

**Jerry D. Saye (37)** Organization of Information, History of Books and Libraries, Cataloging and Classification, Technical Services, Abstracting and Indexing, Metadata

**Barbara M. Wildemuth (45)** Information-Seeking Behaviors and Information Use, Design and Evaluation of Information Systems, Adoption and Use of Information Technologies

**Associate Professors**

- David Carr (90) Cultural Institutions and Thinking, Reading for Pleasure, Tools and Cognition, Collections, Reference, Concepts of Service
- Claudia J. Gellert (69) Information and Reference Services, Consumer Health Information, Health Sciences Librarianship, Information Services for Diverse User Groups, Public Libraries
- Stephanie W. Haas (47) Natural Language Processing, Information Retrieval, Sublanguage and Terminology, Genre and Discourse Structure
- Helen R. Tibbo (46) Archives and Records Management, Information Services for the Humanities, Electronic Information Retrieval, Reference Service

**Assistant Professors**

- Deborah Barracl (78) Information Systems, Organizational Behavior, Human-Computer Interaction, Communication, Digital Libraries
- Jane Greenberg (92) Metadata, Information Organization and Retrieval, Abstracting and Indexing, Archives
- Bradley M. Hemminger (109) Medical and Bio-Informatics, Computer-Human Interfaces, Computer-Supported Collaborative Work and Information Visualization
- Brian W. Sturm (87) Storytelling and Folklore, Children's and Young Adults' Literature and Public Library Services, Children and Technology, Bibliotherapy

**Clinical Instructors**

- Kristin Chaffin (110) Database Management, Web Databases
- Paul Jones (74) Director of thebiblio.org; Internet Issues and Applications Including Digital Libraries, Electronic Publishing, Online News, Virtual Communities, Legal and Social Issues Relating to Networked Information and Access

**Lecturers**

- Scott D. Adams, Internet Applications
- David C. MacDonald, Human Information Interactions

**Adjunct Faculty**

- Paul Conway, Archives
- David A. Fensel, Bioinformatics
- Laura N. Gasaway, Law Librarianship
- Carol G. Jenkins, Health Sciences Librarianship
- Charles B. McNamara, Rare Book Librarianship
- Timothy R. Sanford, Information Literacy Instruction, College Teaching
- Diane C. Strauss, (35) Business Information Sources
- B. Lynn Whitten, Health Information Resources
- Mary C. Whitton, Collaborative Information Technology
Distinguished Research Professor
Frederick Kilgour (48) Use of "Known-item" Books for Information Retrieval

Professors Emeriti
Robert Broadus
Raymond L. Carpenter
Mildred H. Downing
Jean Freeman
James F. Gowan
Edward G. Holley
Mary E. Kingsbury
Gertrude London
Charles Haynes McMullen
Mary W. Oliver
Jerold Omer
William M. Shaw Jr.

The programs of the School of Information and Library Science (SILS) are designed to prepare students for professional employment and advanced study in the fields of information and library science. The school offers graduate instruction leading to the degrees of Master of Science in Information Science (MSIS) and Master of Science in Library Science (MSLS), Certificate of Advanced Study (CAS), and Doctor of Philosophy (Ph.D.) in Information and Library Science.

The MSIS is designed to prepare students to contribute to the design, development, and maintenance of information systems and networks; to provide leadership in the development of new technologies and new applications relating to the delivery of information to people seeking and utilizing information; and to demonstrate a theoretical knowledge of information science, including the theory of information storage and retrieval, systems science, and social, political, and ethical implications of information systems. Within this degree program, students may focus their choice of courses on a number of specializations. Examples of possible specializations include: human information behavior, database and information retrieval systems, information architecture, networking and Internet technologies, and management of information systems.

The MSLS program prepares students for professional employment in information and library service. The degree is designed to prepare students for work involving the collection, organization, storage, and retrieval of recorded knowledge for a variety of individuals and groups. Analysis and design skills are emphasized. Areas where students find jobs include: library administration, administration of archives and manuscript collections, records management, documents librarianship, cataloging, public and reference services, acquisitions and collection management, children’s librarianship, access and manipulation of database information, special collections, various subject areas, and systems librarianship. Graduates of the program are ready to practice within various settings: academic, public or special libraries, information centers, or school library media centers.

Students must have a basic knowledge of computing applications (e.g., word processing, spreadsheets, email) prior to admission. Each master’s student is required to complete one course in each of the curriculum’s five functional areas: organization, collection/retrieval, human information behavior, design/evaluation, and management. A course in Information Tools (INLS 102), which provides students with a foundation in various tools (e.g., html, database) employed in the curriculum is also required as is a course in Research Methods (INLS 201). The remainder of the forty-eight credit hours of course work is then selected, in consultation with the student’s faculty advisor, from the information and library science curriculum, or as appropriate, from related subject fields in other schools and departments of the University. A master’s paper is also required of each master’s student. A theme within the curriculum for both master’s degrees is evidence-based practice.

The School of Information and Library Science participates in several dual or cooperative degree programs. These include:

- A dual degree program with the Kenan-Flagler Business School, which combines the Master of Business Administration (MBA) degree and the Master of Science in Information Science (MSIS) degree.
- Dual degree programs with the Department of Health Policy Administration, School of Public Health, which combine the Master of Health Administration (MHA) degree with either the Master of Science in Library Science (MSLS) or Master of Science in Information Science (MSIS) degree.
- The cooperative archival program, which allows students to combine the Master of Arts (M.A.) in Public History at North Carolina State University with either the Master of Science in Library Science (MSLS) or Master of Science in Information Science (MSIS) with specializations in archival science.

Participation in any of these programs requires separate admission to both degree programs. Additional dual degree programs are under development with the Schools of Law and Nursing.

The basic requirement for admission to the master’s programs is a bachelor’s degree from a recognized college or university. The student’s undergraduate work should demonstrate a strong foundation in liberal arts and sciences; a course in computer programming will be helpful. Admission involves meeting the requirements for the Graduate School and submission of acceptable scores on the General Test of the Graduate Record Examination. For details about the entrance requirements and the curriculum for the master’s programs, see the catalog of the School of Information and Library Science.

The Certificate of Advanced Study in Information and Library Science is a 30-semester-hour post-master’s degree program that is designed for practitioners who seek an articulated and systematic continuing education program to enhance their professional career development in information and library science.

The Doctor of Philosophy in Information and Library Science is a research degree. Thus, the purpose of the doctoral program in SILS is to educate scholars who are capable of addressing problems of scholarly consequence in the field of information and library science. Toward this end each student develops a program of studies, which is tailored to individual interests and career goals. Required classes include a year-long seminar on Research Issues and Questions (INLS 301/302) and completion of an appropriate sequence of courses in statistics. Additional courses in research methods and theory development are recommended as are research experience courses. There are also opportunities for students to develop teaching skills through both course work and teaching experience.

The school occupies three floors of Manning Hall, with the administrative and faculty offices, classrooms, ibiblio.org (one of the most popular Web sites on the Internet), and the Information and Technology Resource Center (ITRC) all contained in that building. The ITRC includes the Information and Library Science Library, which holds more than 86,000 volumes, and a departmental computer lab. The computer lab includes a 32-seat classroom with Dell Dimension Pentium IV 1.3Ghz PCs (19-inch monitor, 256 MB DRAM, 20GB disk drive, CDRW, sound, ZIP drive, video conferencing cameras and flatbed scanners on 10 different machines) and a 15-seat general purpose area with Dell Optiplex 400 MHz Pentium II PCs and the above described Dell Dimensions. Also in the computer lab
are two dual processor Sun Fire Unix servers, a dual processor E550 Unix
server, a dual processor Pentium III file server, a 14-drive CD-ROM server
tower, and assorted peripherals such as laser printers and digital video and
single shot cameras, network wireless cards, and six PIII IBM laptops.
Each machine in the ITRC is connected to the school's departmental
Ethernet via a dedicated 10MB switch port, and each server is connected
using a dedicated 100MB Ethernet connection. Wireless access is located
through the building's public areas including the ITRC, classrooms, and
around Manning Hall. The school's network is connected to the UNC
campus backbone over a 1GIG FDDI connection and then to the Internet
via the campus 155MB ATM link. The ITRC has a wide variety of the most
current software applications for Internet access and web page pro-
duction, graphics and image manipulation, database management, statistical
analysis, word processing, multimedia development, software develop-
ment, and CD-ROM searching. The University is a participant in the
Internet2 project and the North Carolina GigaPOP initiative and had in
place at press time a second 155 MB connection to Internet2.
Those interested in any of the SILS degree programs should see the
school's web page (ils.unc.edu), or request information from the School
of Information and Library Science, CB #3360, 100 Manning Hall, The
University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-
3360. (E-mail: info@ils.unc.edu)
NOTE: The prefix for all School of Information and Library Science courses
is INLS. When a prerequisite is listed for a course, it may be assumed that an
equivalent course taken elsewhere or permission of the instructor also fulfills
the prerequisite or corequisite. The course instructor must approve the equivalency
of the substitute course.
Although graduate students may take courses numbered below 100, they
will not receive credit toward a graduate degree for those courses.

Courses for Graduates and Advanced Undergraduates

102 INFORMATION TOOLS (3). Tools and concepts for information use, informa-
tion literacy, microcomputer software use and maintenance, microcomputer
applications, and networked information systems. Newby.

105 INFORMATION ETHICS (3). An overview of ethical reasoning followed by
discussion of issues most salient to information professionals, e.g., intellectual prop-
erty, privacy, access/censorship, effects of computerization, and ethical codes of conduct.

108 HISTORY OF THE BOOK AND OTHER INFORMATION FORMATS
(3). History of the origin and development of the book in all its forms: clay
tabets to electronic. Coverage includes scientific and other scholarly publications,
religious works, popular literature, periodicals, newspapers. Saye.

109 HISTORY OF LIBRARIES AND OTHER INFORMATION-RELATED
CULTURAL INSTITUTIONS (3). History of cultural institutions related to
information from earliest times to the present day. Includes specific institutions,
trends in service and facilities, and individuals important in the development of
these institutions. Saye.

110 SELECTED TOPICS (3). Exploration of an introductory-level special topic
not otherwise covered in the curriculum. Previous offerings of these courses does not
predict their future availability; new courses may replace these. Courses offered during
past years include:

110-40 MACHINE LEARNING. Losee.

110-45 INFORMATION ETHICS. Wildermuth.

110-47 INFORMATION SYSTEMS AND SERVICES: WHERE DO WORDS
MATTER. Haas.

110-69 CONSUMER HEALTH INFORMATION. Gollop.

110-73 COLLABORATION STRATEGIES. Sonnenwald.

110-98 INTRODUCTION TO DIGITAL LIBRARIES. Nelson.

110-105 BOOKS, PUBLISHING, AND THE MEDIA. Murphy.

111 INFORMATION RESOURCES AND SERVICES (3). Prerequisite or coreq-
quisite. INLS 102. Analysis, use, and evaluation of information and reference sys-
tems, services, and tools with attention to printed and electronic modes of delivery.
Provides a foundation in search techniques for electronic information retrieval,

111L COMPUTER LABORATORY TO SUPPORT INLS 111. Focus on elec-
tronic retrieval techniques. Must be taken concurrently with INLS 111.

115 NATURAL LANGUAGE PROCESSING (Computer Science 171) (3).
Prerequisite. Computer Science 14, 15, or 16. Statistical, syntactic, and semantic
models of natural language. Tools and techniques needed to implement language
analysis and generation processes on the computer. Haas.

121 PRINCIPLES AND TECHNIQUES OF STORYTELLING (3). An
overview of storytelling, its historical development, and the presentation and
administration of storytelling programs. The class focuses on performance skills
merged with theoretical issues. Sturn.

122 YOUNG ADULT LITERATURE AND RELATED MATERIALS (3). A sur-
evvy of print and nonprint library materials particularly suited to the needs of adoles-
cents. Sturn.

123 CHILDREN'S LITERATURE AND RELATED MATERIALS (3). Survey
of literature and related materials for children, with emphasis on twentieth-century
authors and illustrators. Sturn.

124 CHILDREN AND TECHNOLOGY (3). Study of the design of computer
interfaces for the use of technology by children. Includes Internet issues, educational
CD-ROMs, and computerized library catalogs. Sturn.

131 MANAGEMENT FOR INFORMATION PROFESSIONALS (3). An intro-
duction to management in libraries and other information agencies. Topics to be
studied include planning, budgeting, organizational theory, information sources for
managers, staffing, leadership, organizational change, and decision making. Daniel,
Moran, Solomon.

144 CULTURAL INSTITUTIONS (3). This course will explore cultural institu-
tions -- libraries, museums, parks, zoological and botanical gardens, reconstructions
and other settings -- as lifelong educational environments. Carr.

145 INTRODUCTION TO ARCHIVES AND RECORDS MANAGEMENT
(3). Survey of the principles, techniques and issues in the acquisition, management,
and administration of records, manuscripts, archives and other cultural and docu-
mentary resources in paper, electronic, and other media formats. Tibbo.

150 ORGANIZATION OF INFORMATION (3). Introduction to the problems
and methods of organizing information, including information structures, knowl-
edge schemas, data structures, terminological control, index language functions, and
implications for searching. Greenberg, Solomon.

151 ORGANIZATION OF MATERIALS I (3). Introduction to the organization
of library materials. Covers formal systems for description, access, and subject cata-
logging, including AACR2, MARC, Dewey Decimal Classification, Library of
Congress Classification, and subject headings. Saye.

153 RESOURCE SELECTION AND EVALUATION (3). Identification, provi-
sion, and evaluation of resources to meet primary needs of clientele in different
institutional environments. Carr.

161 NON-NUMERIC PROGRAMMING FOR INFORMATION SYSTEMS
APPLICATIONS (3). An introduction to computer programming for library oper-
ations and information retrieval applications. Losee.
162 SYSTEMS ANALYSIS (3). Introduction to the systems approach to the design and modeling of system functionality (e.g., structured analysis) and data represented in the system (e.g., object-oriented analysis) are studied. Haas, Wildemuth.

165 RECORDS MANAGEMENT (3). Introduces the principles of records center design, records analysis and appraisals, filing systems, reprographics and forms, reports and correspondence management. Legal issues and the security of records are also covered. Staff.

170 APPLICATIONS OF NATURAL LANGUAGE PROCESSING (Computer Science 170) (3). Prerequisite, Computer Science 14, 15, or 16, or graduate standing in Information and Library Science. Study of applications of natural language processing techniques and the representations and processes needed to support them. Topics include interfaces, text retrieval, machine translation, speech processing, and text generation. Haas.

172 INFORMATION RETRIEVAL (Computer Science 172) (3). Study of information retrieval and question answering techniques, including document classification, retrieval and evaluation techniques, handling of large data collections, and the use of feedback. Losee, Newby.

180 HUMAN INFORMATION INTERACTIONS (3). The behavioral and cognitive activities of those who interact with information, with emphasis on role of information mediations. How information needs are recognized and resolved; use and dissemination of information. Fall, spring. Gogol, Marchionini, Wildemuth.

180L HUMAN INFORMATION INTERACTION RECEPTION (0.5). Prerequisite, graduate standing. Students will practice various techniques for organizing and delivering a presentation. Effective employment of visual aid. Group process skills. Special attention and techniques for those with fear of public speaking. Fall, spring. Staff.

181 INTERNET APPLICATIONS (3). Prerequisite, INLS 102. Introduction to Internet concepts, applications, and services. Introduces the TCP/IP protocol suite along with clients and servers for Internet communication, browsing, and navigation. Examines policy, management, and implementation issues. Dempsey, Newby.

182 INTRODUCTION TO LOCAL AREA NETWORKS (3). Prerequisite, INLS 102. Introduction to local area network hardware, topologies, operating systems, and applications. Also discusses LAN management and the role of the network administrator. Staff.

183 DISTRIBUTED SYSTEMS AND ADMINISTRATION (3). Prerequisite, INLS 80, INLS 174, INLS 181, or INLS 182. Distributed and client/server-based computing. Includes operating system basics, security concerns, and issues and trends in network administration. Newby.

184 PROTOCOLS AND NETWORK MANAGEMENT (3). Prerequisite, INLS 80 or INLS 181 or INLS 182. Network protocols and protocol stacks. Included are discussions of protocol classes, packet filtering, address filtering, network management and hardware such as protocol analyzers, repeaters, routers and bridges. Cogan.

186 TCP/IP NETWORKING AND NETWORK PROGRAMMING (3). Prerequisites, INLS 161 or 184, or COMP 142. In-depth examination of the algorithms underlying the TCP/IP Internet protocol suite, including performance issues and operational problems. Introduction to client/server network programming (in C/C++/Java) using the standard BSD sockets interface. Dempsey.


191 ADVANCED INTERNET APPLICATIONS (3). Prerequisite, INLS 180 or INLS 181. Study of design and implementation of state-of-the-art Internet applications. Example topics include multimedia authoring tools, dynamic content generation techniques, and server-side configuration and programming. Fall. Dempsey, Newby.

Courses for Graduates

201 RESEARCH METHODS (3). Prerequisite, completion of INLS 180 and either INLS 111 or INLS 172. An introduction to research methods used in library and information science. Includes the writing of a research proposal. Losee, Solomon, Sonnenwald.

203 INFORMATION SYSTEMS EFFECTIVENESS (3). Prerequisite, INLS 201 recommended. Addresses issues of performance measurement and methodology in the evaluation of information systems and services. The roles of objectives, performance measures, data collection approaches, and analytical approaches will be considered. Wildemuth.

204 INTERNATIONAL AND CROSS-CULTURAL PERSPECTIVES FOR INFORMATION MANAGEMENT (3). Examines information in society for selected nations/cultures. Compares institutions, processes, and trends in the globalization of information management in the face of barriers of language and culture. Daniel, Solomon.

210 INTERMEDIATE SELECTED TOPICS (3). Exploration of an intermediate-level special topic not otherwise covered in the curriculum. Previous offering of these courses does not predict their future availability; new courses may replace these. Courses offered during past years include:

210-40 EVOLVING OPTIMAL INFORMATION SYSTEMS. Losee.

210-46 CULTURAL RESOURCE: DIGITAL PRESERVATION AND ACCESS. Tibbo.

210-53 LIBRARY INFORMATION SYSTEMS. Kochanek.

210-69 CONSUMER HEALTH INFORMATION. Gogol.

210-96 INFORMATION ENTREPRENEURSHIP. Marshall.

211 INFORMATION RETRIEVAL SEARCH STRATEGIES (3). Prerequisites, INLS 111 or INLS 172. Investigates information retrieval techniques and strategies from the world of electronic information sources, including commercial and Internet databases and search engines. Data analysis, marketing, and end-user products and services are explored. Staff.

213 USER PERSPECTIVES IN INFORMATION SYSTEMS AND SERVICES (3). Explores the roles of information in human activity. Resulting insights are directed toward design of user-oriented systems. Psychological, social, economic, political, and other situational perspectives are taken. Solomon, Wildemuth.

214 USER EDUCATION (3). Prerequisites, INLS 111, INLS 180 or permission of instructor. Examines the history and context of LIS training programs. Pedagogy: teaching skills, methods of evaluation, are addressed. Students may tailor learning projects to their own interests. Daniel.

216 HEALTH SCIENCES ENVIRONMENT (3). Prerequisites, INLS 111, INLS 131 or permission of instructor. Trends in health care delivery, biomedical research and health sciences education with emphasis on the impact and use of information. Includes observation of clinical and research settings. Gogol, Marshall.

218 INFORMATION SERVICES AND SPECIFIC POPULATIONS (3). Service, professional, and administrative issues related to information access by non-traditional information service users. The course examines trends, public policy, ethical issues, programming, and evaluation of services. Gogol.

222 SCIENCE INFORMATION (3). Prerequisite, INLS 111. Survey of the communication of scientific information and the information sources in the physical and biological sciences emphasis on major bibliographic and fact sources including on-line reference services. Staff.
224 HUMANITIES AND SOCIAL SCIENCES INFORMATION (3).
Prerequisite, INLS 111. Survey of information and its needs in the social sciences and humanities, with an emphasis on information use and search strategies and on reference and other information resources. Carr.

225 HEALTH SCIENCES INFORMATION (3). Prerequisite, INLS 111. A survey of information used in the health sciences disciplines and professions: The organization of sources, current techniques, and tools for its control including online databases. Gallop.

226 MANAGING SERIALS IN AN ELECTRONIC AGE (3). Prerequisites, INLS 111 and INLS 151. Survey of technical and public services aspects of serials management, including publishing, acquisition, collection development, organization, cataloging, licensing, access, and preservation of print and electronic serials. Staff.

227 BUSINESS INFORMATION (3). Prerequisite, INLS 111. Combines an introduction to basic business concepts and vocabulary with consideration of current issues in business librarianship and of key print and electronic information sources. Strauss.

228 PUBLIC DOCUMENTS (3). Prerequisite, INLS 111. A survey of the major publications of the United States federal government, United Nations, United States governments, and British government, with attention to the selection, classification, and administration of a document collection. Van Fossen.

229 LAW LIBRARIES AND LEGAL INFORMATION (3). Prerequisite, INLS 111. An introduction to the legal system and the development of law libraries, their unique objectives, characteristics, and functions. The literature of Anglo-American jurisprudence and computerized legal research are emphasized as well as research techniques. Strauss.


233 MANAGING THE INFORMATION SYSTEMS ORGANIZATION (3). Prerequisite, INLS 131 recommended. Presents the broad scope of responsibilities inherent in information systems management. Topics include management controls, security, maintenance, human resources requirements, and associated issues of information system planning and development. Staff.

234 HUMAN RESOURCES MANAGEMENT (3). Prerequisite, INLS 131. An in-depth look at the management of human resources in libraries and other information agencies. Includes topics such as recruitment, hiring, job analysis, performance appraisal, training, and compensation. Moran.

235 DIGITAL LIBRARIES: PRINCIPLES AND APPLICATIONS (3). Research and development issues in digital libraries including: collection development and digitization, mixed mode holdings; access strategies and interfaces, metadata and interoperability, economic and social policies, and management and evaluation. Marchionini.

237 MARKETING OF INFORMATION SERVICES (3). Application of marketing theory to libraries and other information settings. Includes consumer behavior, market research, segmentation, targeting and positioning, public relations, product design, and sales promotion. Daniel.

241 THE SCHOOL LIBRARY MEDIA CENTER (3). Philosophy and mission of the school library media center in context of the educational environment. Consider program planning and evaluation, policy development, and examination of current issues. Daniel.


243 ADMINISTRATION OF PUBLIC LIBRARY WORK WITH CHILDREN AND YOUNG ADULTS (3). Objectives and organization of public library services for children and young adults: designed for those who may work directly with young people or who intend to work in public libraries. Sturm.

245 ADVANCED ISSUES AND PRACTICES IN ARCHIVES AND MANUSCRIPTS ADMINISTRATION (3). Prerequisite, INLS 145 or equivalent. Examines issues in the administration of archival, manuscripts, and records programs. Explores how theory relates to professional practice. Students process a collection from appraisal through creation of an electronic finding aid. Tibbo.

246 MUSIC LIBRARIANSHIP (3). Survey of the history and practice of music librarianship, with an emphasis on administration, collection development, and public service in academic and large public libraries. Staff.

247 SPECIAL LIBRARIES AND KNOWLEDGE MANAGEMENT (3). Prerequisite, INLS 131. Professional competencies required to work as special librarian or knowledge manager in corporate or nonprofit setting. Strategic planning, organizational dynamics, tailoring services, intranet design, value-added measures, intellectual capital. Spring. Daniel.

252 METADATA ARCHITECTURES AND APPLICATIONS (3). Prerequisite, INLS 150 or 151 or 172. Examines metadata in digital environment. Emphasizes the development and implementation of metadata schemas in distinct information communities and the standards and technological applications used to create machine understandable metadata. Greenberg.

254 PRESERVATION OF LIBRARY AND ARCHIVE MATERIALS (3). An introduction to current practices, issues, and trends in the preservation of materials for libraries and archives with an emphasis on integrating preservation throughout an institution's operations. Hirt.

256 DATABASE SYSTEMS I (3). Prerequisites, INLS 102 and INLS 162. A study of the relational database model including entity-relationship theory, design, normalization techniques, and query language. Haas.

257 USER INTERFACE DESIGN (3). Prerequisite, INLS 162. Basic principles for designing the human interface to information systems, emphasizing computer-assisted systems. Major topics: users' conceptual models of systems, human information processing capabilities, styles of interfaces, evaluation methods. Wildermuth.

258 DATABASE SYSTEMS II (3). Prerequisite, INLS 256. Advanced study of database systems. Topics include database design, administration, current issues in development and use, object databases, and distributed databases. Haas.

259 WEB DATABASES (3). Prerequisites, INLS 181 or equivalent, INLS 256 or equivalent, and programming experience. Explores concepts and practice surrounding the implementation and delivery of web-enabled databases. Students will gain experience with and evaluate PC and Unix web database platforms. Spring. Chaffin.

265 ABSTRACTING AND INDEXING FOR INFORMATION RETRIEVAL (3). Prerequisite, INLS 90, INLS 150, or INLS 151. Examines abstracting, indexing, and classification principles and techniques for document and object (non-textual material) analysis. Human and automated techniques are covered. Spring. Greenberg.

281 INTERNET ISSUES AND FUTURE INITIATIVES (3). Prerequisite, INLS 181 or equivalent. Members of this seminar discuss emerging Internet policy issues such as copyright, intellectual property, privacy, and security and explore emerging Internet tools and applications. Jones.

299 SUPERVISED FIELD EXPERIENCE (3). Prerequisites, completion of twenty-four semester hours and permission of advisor. Supervised observation and practice in an information service agency or library. The student will work required amount of time in the work setting under the supervision of an information/library professional and will participate in faculty-led group discussions for ongoing evaluation of the practical experience. Solomon.
300 STUDY IN INFORMATION AND LIBRARY SCIENCE (1-3, repeatable). Prerequisite, permission of the instructor. Study by an individual student on a special topic under the direction of a specific faculty member. Six credit maximum for master's students. Graduate faculty.

301 RESEARCH ISSUES AND QUESTIONS I (3). Prerequisite, doctoral status or permission of instructor. Intensive and systematic investigation of the fundamental ideas in information and library science. Exploration and discussion in seminar format. Must be taken in fall semester followed by INLS 302 in spring. Fall. Graduate faculty.

302 RESEARCH ISSUES AND QUESTIONS II (3). Prerequisite, doctoral status or permission of instructor. Intensive and systematic investigation of the fundamental ideas in information and library science. Exploration and discussion in seminar format. Must be taken in spring semester immediately after INLS 301 in fall. Spring. Graduate faculty.

304 SEMINAR IN THEORY DEVELOPMENT (3). Prerequisite, doctoral or advanced master's student status. Discussion and critique of the structural components and processes utilized in theory development. Seminar provides knowledge relating to the various stages of theory building. Sonnenwald.

308 SEMINAR IN TEACHING AND ACADEMIC LIFE (3). Prerequisite, doctoral student or advanced master's student status. Examine teaching, research, publication, and service responsibilities. Provides perspective on professional graduate education and LIS educational programs. Explores changing curricula and discusses ethics, rewards, and print of academic life. Staff.

309 SEMINAR IN TEACHING PRACTICE (1-3). Prerequisites, doctoral or advanced graduate student status, INLS 303. For doctoral students currently involved in teaching activities. Regular seminar meetings to discuss relevant literature and aspects of the teaching experience. Carr.

310 ADVANCED SELECTED TOPICS (1-6). Exploration of an advanced special topic not otherwise covered in the curriculum. Previous offering of these courses does not predict their future availability; new courses may replace these. Courses offered during past years include:

310-52 QUALITATIVE DATA COLLECTION AND ANALYSIS. Solomon.

310-90 SEMINAR IN INFORMATION AND CULTURE. Carr.

320 SEMINAR IN CHILDREN'S LITERATURE (3). Prerequisite, INLS 123. Advanced study of a selected topic relating to literature for children. Staff.

325 SEMINAR IN POPULAR MATERIALS IN LIBRARIES (3). Selected topics relating to the roles of various types of libraries in the provision and preservation of popular materials (light romances, science fiction, comic books, etc.) existing in various forms (print, recorded sound, etc.). Moran.

341 SEMINAR IN PUBLIC LIBRARIES (3). Prerequisite, completion of twelve semester hours. Selected topics in public library services, systems, networks, and their management. Current issues are emphasized, along with the interests of the participants. Godel.

342 SEMINAR IN ACADEMIC LIBRARIES (3). Prerequisite, INLS 131. Study of problems in the organization and administration of college and university libraries with emphasis on current issues in personnel, finance, governance, and services. Moran.

349 SEMINAR IN RARE BOOK COLLECTIONS (3). A study of the nature and importance of rare book collections; problems of acquisition, organization, and service. McNamara.

357 SEMINAR IN HUMAN-COMPUTER INTERACTION (3). Prerequisite, INLS 257 or permission of instructor. Research and development in design and evaluation of user interfaces that support information seeking. Major topics: interactivity, needs assessment, query and browser interactions, interactive design and maintenance, usability testing. Marchionini.

372 SEMINAR IN INFORMATION RETRIEVAL (3). Prerequisites, INLS 172 and doctoral student status or permission of the instructor. Seminar on the basic questions that arise in information retrieval research and the methods and theories that enable observation, analysis, and interpretation. Staff.

376 SEMINAR IN INFORMATION (3). Prerequisite, advanced master's or doctoral standing. Examines the idea of information as used by different disciplines and cultures at different historical periods. Luse.

379 RESEARCH IN INFORMATION RETRIEVAL (1-6, repeatable). Prerequisite, permission of the instructor. Supports individual and small group research undertaken by doctoral students in information retrieval intended to produce research results of publishable quality. Staff.

382 SEMINAR IN COMMUNICATION (3). Prerequisite, doctoral student status or permission of the instructor. Seminar on the basic questions that arise in communication research and the methods and theories that enable observation, analysis, and interpretation. Staff.

389 RESEARCH IN COMMUNICATION (1-6, repeatable). Prerequisite, permission of the instructor. Supports individual and small group research undertaken by doctoral students in communication intended to produce research results of publishable quality. Staff.

392 MASTER'S PAPER (3). Provides a culminating experience for master's degree students who engage in independent research or project effort and develop a major paper reporting the research or project under the supervision of a faculty member. Staff.

394 DOCTORAL DISSERTATION (3 or more). Staff.

399 RESEARCH IN INFORMATION AND LIBRARY SCIENCE (1-6, repeatable). Prerequisite, permission of the instructor. Supports individual and small group research undertaken by doctoral students in information and library science intended to produce research results of publishable quality. Staff.

**INTERDISCIPLINARY BIOMEDICAL SCIENCES (IBMS) PROGRAM**

**Professors**

William Arensbergh, Cell and Integrative Biology of Vascular and Nephron Function, Interactions of Endothelial Vascular Smooth Muscle and Tubular Epithelial Cells in Hypertension

Steven Bachrach, Molecular Biology of Viruses

Kerry S. Bloom, Structural Organization and Eukaryotic Chromosomes, Chromosome and Spindle Dynamics

Walter Boulechule, Neuroneuroendocrinology, Developmental Neurobiology

David Brenner, Regulation of Gene Transcription

Keith W. T. Burridge, Adhesion-Mediated Cell Signaling, Tyrosine Phosphatases, Focal Adhesions

Jannie G. Cannon, Genetics of Pathogens, Pathogenesis of Infectious Disease

Michael Caplow, Biochemistry of the Cytoskeleton and Signal Transduction

Johnny Carson, Developmental Biology and Pathogenic Mechanisms Involving Mammalian Airways

Charles W. Carver, Structural Molecular Biology, Protein Structure-Function, X-ray Crystallography of Proteins Including Aminoacyl tRNA Synthetases, Enzyme of Pyrimidine Metabolism, Phasing Methods

Edward L. Chaney, Computer Vision, Image-Guided Planning and Delivery of Radiation Therapy and Interventional Procedures, Incorporating Images into Electronic Patient Records

Stephen G. Chaney, Chemistry and Mechanism of Action of Platinum Anticancer Agents; DNA Repairs, Effects of DNA-Damaging Agents on Gene Expression; Cancer Chemotherapy

Myron S. Cohen, Oxidative Metabolism of Phagocytic Cells, Interaction of Phagocytes with Bacterial Pathogens
Fulton Crews, Neurotransmitter and Hormone Signal Transduction
Channing J. Der, Oncogenes and Tumor Suppressor Genes, Signal Transduction and Carcinogenesis
Linda Dykstra, Behavioral Pharmacology, Opoid Analgesics, Neuroimmunology
H. Sheldon Earp, Growth Factor Receptors, Signal Transduction Tyrosine Kinases
Marshall H. Edgell, Generic Engineering, Molecular Genetics, Behavior Genetics
Beverly Errede, Function and Regulation of MAP-Kinase Activation Pathways in Saccharomyces Cerevisiae, Signal Transduction, Genetics
James Faber, Cell and Molecular Analysis of Signal Transduction in Vascular Smooth Muscle and Microcirculation
Paul Farid, Regulation of Neuron Number, Neuromuscular Specificity, Neuro Central and Peripheral Axon Guidance
Arthur Finn, Molecular Mechanisms of Chloride Transport in Epithelial Cells
Donald Forman, Clinical Chemistry, Alcohol Metabolism, Pediatric Metabolic Diseases
Jeffrey Frelinger, Immunoenergetics, Molecular Genetics and Immunology of the Mouse and Human Major Histocompatibility Complex
John Garzy, Solute and Water Transfer across Epithelia, Cellular Pharmacology and Toxicology of Heavy Metals
Patricia Gensel, Paleobotany (Palyontology), Plant Morphology, Evolution
Lawrence Gilbert, Insect Endocrinology, Molecular Genetics, Biochemistry, and Physiology
Avram Gold, Structure-Reactivity Relationships in Metabolism and Mutagenicity of Poly cyclic Aromatic Hydrocarbons
Barry Goz, Cancer Chemotherapy and Cellular Control Mechanisms
Noelle Granger, Developmental Biology, Endocrinology, Neuroendocrinology
Jack D. Griffith, Molecular Structure of Recombination Complexes, Electron Microscopy of DNA-Protein Complexes, HIV Research
T. Kendall Harden, Receptor Biochemistry, Regulation of Second Messenger Signaling
Albert K. Harris, Movement of Tissue Cells in Animal Development and Cancer Invasiveness
Geoffrey Haughton, Transplantation Genetics
O’Dell Hanson Jr., Ear Structure and Function, Animal Sonar
Jan Hermans, Theoretical Approaches to Structure and Function of Proteins, Computer Modeling, Molecular Dynamics and Thermodynamics
Max H. Hammersand, Physiology, Morphology, Systematics, and Biogeography of Marine Algae
Eng-Shang Huang, Molecular Biology and Pathology of Human Cytomegalovirus, Tumor Virology
Clyde A. Hutchinson III, Genetic Engineering, Molecular Genetics, Virus Structure
Kenneth A. Jacobson, Membrane Biology and Biophysics of Cell Locomotion, Video Image Analysis
Charles Jeanteau, Nephropathology, Immunologic and Inflammatory Mediator Systems in the Pathogenesis of Vasculitis and Renal Disease, Especially Glomerulonephritis
Robert E. Johnston, Molecular Genetics of Viral Pathogenesis; Recombinant Viral Vaccines
Rudolph L. Juliano, Membrane Biochemistry of Cell Interactions, Drug Delivery Systems
David Kaufman, Cellular and Molecular Mechanisms of Cancer Development, Cell-Cycle Influences on Carcinogenesis, Cell-Cell and Cell-Matrix Interactions in Human Endometrial Biology and Carcinogenesis
David G. Klapper, Immunohemistry, Immunogenetics; Structure of Proteins of Immunologic Interest
William Koch, Developmental Biology
Robert Kosy, Biomedical Materials, Applied Mechanics, Structure-Property Relationships
Jean Lauder, Developmental Neurobiology and Neurotoxicology, Neuronal-Glial Interactions
John Lemasters, Mechanisms of Hypoxic and Toxic Injury to Cells, Cellular and Molecular Bioenergetics
Barry R. Lents, Biomembrane Structure and its Relationship to Function, Platelet Membranes in Blood Coagulation, Membrane Fusion, Liposomes
Alan Light, Neurobiology, Anatomy, and Pharmacology of Somatosensory Neurons
Susan Lord, Genetic Engineering, Molecular Biology of Fibrinogen
Carol Lucas, Hemodynamics, Pulmonary Circulation, Digital Signal Processing, Mathematical Modeling
Pauline Kay Lund, Molecular Endocrinology, Molecular Gastroenterology, Signal Transduction
Nobuyo Maeda, Molecular Genetics of Atherosclerosis, Molecular Evolution of Multi-Gene Families, Apolipoprotein Genes
Richard Mailman, Molecular and Biochemical Neuropharmacology and Molecular Drug Design of Parkinson’s Disease and Schizophrenia
Patricia Marques, Proto-Oncogene Function in the Nervous System, Signal Transduction and Growth Control
William F. Marnell, Transcriptional and Post-transcriptional Regulation of RNA Metabolism, Cell Cycle Regulation during Development
Steve W. Martin, Molecular Biology, Biochemistry of DNA Replication and Repair, Genetics of DNA Helicases from E. Coli and Yeast
Ann G. Marthysse, Bacterial Plant Pathogens, Bacterial Genetics
Ken McCarthy, Neuronal-Glial Cell Interactions and Differentiation, Role of Astrocytes in Brain Function
Lee McWain, Chemistry of Spinal Motorneurons
Gerhard Meinzer, Release of the Intracellular Ca2+ Ion Channels, Signal Transduction
Beverly Mitchell, Molecular Basis of Chemotherapeutic Specificity, Gene Expression, Leukemia
Pierre Morell, Neurochemistry, Gene Expression Related to Myelin Metabolism, Axonal Transport, Neurotoxicology
Robert Mueller, Neuronal Stimulation and Oncogene Expression
John E. Newbold, Molecular Virology, Molecular Biology of Mitochondria
Michael O’Rand, Cell Biology and Immunology, Reproductive Biology
Gerry S. Oxford, Physiology and Biophysics of Excitable Membranes
Joseph Pagano, Infectious Diseases and Cancer, Regulation and Gene Expression of the Epstein-Barr Virus, Mechanisms of Antiviral Agents
Robert Peet, Ecology, Plant Communities and Populations
H. Benjamin Peng, Cellular and Developmental Neurobiology, Development of the Neuromuscular Junction
Edward Perl, Neurophysiological and Molecular Bases of Somatic Sensation
Thomas D. Peters, Yeast Genetics, Chromosome Structure, Recombination, and Replication
Peter Petrusz, Neurobiology, Neuroendocrinology, Reproductive Biology
John R. Pringle, Cell Cycle, Cytoskeleton and Cellular Morphogenesis, Genome Organization, and Yeast Genetics
Nancy Raab-Traub, Molecular Pathogenesis of Epstein-Barr Virus, Mechanisms of Viral Induced Transformation and Oncogene Activation
James A. Raleigh, Use of Xenobiotic Metabolism to Study Human Tumor Physiology with Nitroheterocyclic Metabolism
Lola Reid, Growth and Differentiation of Stem Cells
Howard Reiner, Immunogenetics of Human Plasma Proteins
Harold Roberts, Hematology
Aldo Rusconi, Neuroanatomy, Neurophysiology, Neurochemistry; Somatosensory System: Connections, Neurotransmitters, and Interneural Integration
Thomas W. Saddler, Teratology, Developmental Biology, Molecular and Cellular Regulation of Neurulation in Mouse Embryos
Edward D. Salmon, Cell Biology, Cell Motility, Micromolecules, Mechanisms of Mitosis and Cell Division
Aziz Savar, Molecular Biology, DNA Repair and Cancer, Structure and Function of DNA Repair Enzymes
Gene A. Scarborough, Structure and Function of Eukaryote Plasma Membranes
Tom K. Scott, Plant Physiology, Phytohormones
Robert Seidman, Cell Biology and Biochemistry of the Neuromuscular Junction and Muscle Sarcolemma, Molecular Mechanism of Duchenne Muscular Dystrophy
Lawrence M. Silverman, Molecular Pathology; Molecular Techniques in Clinical Definition and Diagnosis of Human Genetic Disorders
Gary J. Smith, Genetic Control of Tumorogenesis, Suppression of Tumorogenesis by Normal Cells, Eukaryotic Nuclear and Chromatin Structure, Fluorescence Digital Image Analysis
Oliver Smithies, Targeted Modification of Genes for Use in Gene Therapy
P. Frederick Sparling, Molecular Pathogenesis of Bacterial Infections, Outer Membrane Structure and Iron Utilization by Pathogenic Neisseria Gonorrhoeae and Neisseria Meningitidis
Darrel W. Stafford, Recombinant DNA, DNA Synthesis, DNA Sequencing, Gene Structure
Ann E. Stuart, Synaptic Function in Photoreceptors, Histaminergic Synapses
Kathleen Sulik, Developmental Biology, Genetics and Teratogen-Induced Abnormalities
Kunihiko Suzuki, Neuropathology, Genetic Neurological Disorders Affecting Infants and Children
Ronald Swanstrom, Molecular Biology of HIV, Interaction of Retroviruses with the Host Genome, Replication of Human Retroviruses, HIV Pathogenesis and Drug Resistance
James A. Swanberg, Role of DNA Adducts, Repair and Replication in Carcinogenesis, Toxicology, and Risk Assessment
Dhien Thaker, Drug Metabolism, Mechanisms of Drug Transport, Structure-Transport Relationships, Protein Strategies for Tumor Targeting
Ronald G. Thurman, Hepatic Toxicity, Organ Transplantation
Richard Tidwell, Role of Proteases in Disease Pathogenesis, Design and Synthesis of New Agents for Treatment of Opportunistic Pathogens Associated with AIDS
Jenny Ting, Molecular Immunology, Molecular Regulation of Eukaryotic Genes, Regulation of Transplantation Genes and Proto-Oncogenes, Molecular Mechanisms of Neuregeneration
Michael Tepol, Protein-DNA Interactions and Protein Engineering, Protein Recognition of DNA
Benjamin Tsui, Medical Imaging, Image Processing and Image Reconstruction Methods
Gilbert White, Structure/Function Relations of Platelet Membrane Glycoproteins IIb and IIIa; Intracellular Messengers in Platelet Activation
Barry Whisler, Neural Mechanisms That Underlie the Computational Capacities of the Normal Somatosensory Nervous System
R. Mark Wightman, Ion Channels, Transporters and Membranes, Neurosciences
Elizabeth M. Wilson, Mechanisms of Steroid Hormone Action, Androgen Regulation of Gene Transcription
Richard V. Wolfenden, Enzyme Mechanisms, Water Affinities of Biological Compounds
Priscilla B. Wysocki, Host-Parasite Relationships, Pathogenesis of Infectious Diseases

Associate Professors
Albert Baldwin, Immunoglobulin Gene Expression
Ralph Baric, Molecular Genetics of Coronavirus Transcription, Replication, and RNA Recombination; Virus Evolution; Mechanisms of Virus Interspecies Traffic
Victoria Bautch, Molecular Biology of Blood Vessel Formation in Transgenic Mice, Molecular Genetics of Vascular Development
Dwight Bellinger, Comparative Pathology, Atherosclerosis, Thrombosis, and Hemostasis
Frank Church, Molecular Biology of Thrombosis and Tumor Cell Metastasis, Structure to Activity Function Studies of Serine Proteases and Their Inhibitors, Gene Transfer Studies to Control Thrombosis
Stephen H. Clarke, Molecular Immunology; Structure and Function of Immunoglobulins Genes
Marina Cordiero-Stone, DNA Replication and Repair in Mammalian Cells, Carcinogen Binding and Replication of Damaged DNA in Chemical Carcinogenesis
M. Joseph Costello, Membrane Biophysics, Intercellular Junctions, Active Transport, Membrane Fusion, Electron Microscopy
Stephen Cress, Molecular Mechanisms of Central Nervous System Development, Drosophila Genetics

Jeff Dangl, Genetic and Molecular Analysis of Disease Resistance in Plants
Cora Jean Edgell, Tissue-Specific Regulation of Gene Expression in Human Vascular Endothelial Cells, Somatic-Cell Genetics and Molecular Genetics
Ann H. Erickson, Cellular Protein Targeting; Lysosomal Enzyme Biosynthesis, Site-Directed Mutagenesis and Eukaryotic Expression
Rosamund Farber, Human Molecular Genetics, Cancer Genetics, Simple Sequence Repeat Instability in Cancer Cells, Fragile X Mental Retardation, Neurofibromatosis
Susan Fiscus, Clinical Retrovirology, Immune Response to Retroviral Infections, Anti viral Therapy
Patrick M. Flood, T-Cell Activation, Regulatory T-Cells, Response to HIV Infections
Howard Fried, Cell and Molecular Biology, Mechanisms of Nuclear-Cyttoplasmic Transport, Mechanisms of RNA-Protein Recognition, RNA Structure/Function
James Garbutt, Neurobiology and Pharmacology of Treatment of Alcoholism
Michael Goy, Biochemical Processing of Information in Excitable Cells; Second Messenger Mechanisms in Signal Transduction; Hormonal Control of Secretory Epithelia, Cyclic Nucleotide Chemistry and Metabolism
Curtis Harper, Pulmonary Toxicology, Acute Lung Injury
Henry S. Hsiao, Medical Instrumentation, Computer Applications, Cardiovascular Dynamics
William Kaufmann, Chemical and Radiation Carcinogenesis, DNA Metabolism, Cell-Cycle Checkpoints
Hengming Ke, X-ray Crystallography, Structure and Function of Immunophilins and Cell Cycle Proteins
Shannon C. Kenney, Molecular Regulation of the Epstein-Barr Virus, Development of Gene Therapy for Epstein-Barr Virus-Associated Neoplasms
William Kiernan, Functional Morphology of Invertebrates, Biomechanics
Ryszard Kole, RNA Splicing, RNA-Protein Interactions, Regulation of Gene Expression, Antisense Oligonucleotides as Chemotherapeutic Agents
Steven A. Leadon, Molecular Genetics and Biochemistry of DNA Repair, Oxygen Radicals, Breast Cancer
David Lee, Molecular Regulation of Growth Control and Signaling; Growth Factors and Receptors
William Maizner, Dentistry; Neuropathology, Somatosensory Pharmacology, and Autonomic Pharmacology
Gustavo P. Maroni, Molecular Genetics and Genetic Regulation in Drosophila Melanogaster
Susan Maygroze, General Surgical and Cytopathology, Prostate Carcinogenesis
Royce L. Monggomery, Chronic Pain
A. Leslie Morrow, Molecular Neuropsychopharmacology, Mechanisms of Receptor Gene Regulation
Robert Nicholas, Molecular Mechanisms of Antibiotic Resistance, Cell Signaling through G Protein-Coupled P2Y Purinergic Receptors
Barry Pittella, Stochastic Properties of Single Ion Channels
Leslie Parise, Adhesion Receptors and Cell Signaling
Mitchell Picker, Behavioral Assessment of Narcotics Analgesics
Brian Poppko, Molecular Neurobiology, Myelin, Transgenic Mice
Katherine Pyrczewska, Signal Transduction Mechanisms That Control Polyomavirus Virology, Adenovirus Adherence, Choromiasis, Secretion, and Phagocytosis
Patricia J. Pulkkin, Molecular Mechanisms in Genetic Recombination and Metabolism in Coprinus Sp.
Kathleen W. Rao, Human Cytogenetics, Somatic-Cell Genetics
Wesley Reeves, Molecular Immunology: Autoimmunity, Clinical Immunology
Robert Rosenberg, Ion Channel Electrophysiology, Molecular Mechanisms of Ion Channel Modulation
R. Rudy Samulski, Development of Efficient Viral Vectors for Gene Delivery into Eukaryotic Genes
Gwendolyn Sancar, DNA Repair Genes and Proteins in Yeast and Higher Eukaryotes, Regulation of Gene Expression, DNA Protein Interactions
Lillie L. Seals, Molecular Biology: Eukaryotic Gene Regulation, Transposable Elements; RNA Processing Control in Drosophila, Developmental Genetics
Thomas W. Traut, Enzyme Structure and Regulation, Allosteric Dissociating Enzymes, Pyrimidine Metabolism
Terry Van Dyke, Molecular Regulation of Cell Growth Control; Cell Specificity of Tumor Suppression, Function, Gene Regulation
Bernard Weissman, Isolation of Tumor Suppressor Genes in Pediatric Cancers and Head and Neck Tumors; Gene-Control in Epidermal Keratinocytes
Alan Willard, Developmental Neurobiology, Molecular Mechanisms of Neuronal Modulation
John Wooley, Dermatopathology, Hepatobiliary and Gastrointestinal Pathology

Assistant Professors
Robert B. Bourret, Molecular Mechanisms of Signal Transduction in Bacteria, Including Protein Phosphorylation, Bacterial Chemotaxis
Sharon Campbell, Application of NMR Methods to Investigate Proteins Involved in Signal Transduction; Ras and Ras-Binding Proteins
Richard Cheney, Characterization of Novel Motor Proteins, Molecular Basis of Membrane Cytoskeleton Interactions, Role of IQ Motifs in Cell Regulation and Signal Transduction
William B. Coleman, Biology of Liver Stem Cells, Mechanisms of Hepatocarcinogenesis, Genetic Control of Liver Tumor Suppression
Edward Collins, Structural Immunology, Immunodetection, Drug Development
Adrienne Cox, Tumor Biology, Radiation Biology, and Molecular Therapeutics Related to Lipid Modification, Signal Transduction, and Protein Function of Ras Family Oncogenes
Robert Duronio, Genetic and Molecular Analysis of Cell Cycle Control during Animal Development
Fred T. Fiedorek, Molecular Genetics of Obesity and Diabetes, Mammalian Genome Analysis
Lee Graves, Biochemistry of Growth Factor-Mediated Signal Transduction, Regulation of Protein Kinases
Tom Kuswa, Bacterial Genetics, Molecular Biology of Gene Regulation and Pathogenicity in E. Coli, Molecular Basis for Haemophilus Ducreyi Pathogenesis
Gayle Lester, Bone and Mineral Homeostasis, Ligament Healing
Lian Li, Neuro-Specific Gene Regulation, Molecular Neurobiology, Synaptogenesis, Synaptic Transmission and Gene Targeting
Kenneth Lohmann, Neurobiology, Physiological Mechanisms for Sensing Magnetic Fields
Diane Maia, Surgical Pathology, Hematopathology, Immunopathology
Glenn Matsushima, Molecular Neuroimmunology, Immune Function in Neur degenerative Disease, Signal Transduction and Gene Regulation
Sharon Milgram, Protein Trafficking, Regulation of Endocrine Secretion
Debra Novotny, Surgical and Cytopathology Diagnostic and Prognostic Markers in Gynecologic Neoplasms
Mark A. Peifer, Developmental Genetics; Cell Adhesion and Transcriptional Regulation in Drosophila
Jason W. Reed, Light Signal Transduction in Plants; Plant Development, Light Responses, Nodulation
Lewis H. Romer, Signaling During Endothelial Cell Adhesion and Injury
Michael D. Schaller, The Integrins, Protein Tyrosine Kinases, and Signal Transduction
Jeff Seckel, Genetics of Meiosis
JoAnn Tieto
Robert Goldstein, Generation of Cell Diversity in Development
Lihan Su, Molecular Mechanisms of Immune Response, T-Cell Development and HIV-I Pathogenesis, Hematopoietic Stem Cell (HSC)-Based Gene Therapy
Roland Tisch, Molecular Immunology, Mechanisms of T-Cell Activation and Tolerance Induction, T-Cell Mediated Autoimmunity, Development of Antigen-Specific Immunotherapies
Jean-Michael H. Vos, DNA Replication and DNA Repair, Cancer-Prone Human Hereditary Diseases, Viral-Based Vectors, Gene Therapy Regulatory Domains of G-Protein-Coupled Receptors and Molecular Biology of Cellular Signaling Pathways
Yue Xiong, Mammalian Cell Cycle Control and Cancer, Cyclins, Cyclin-Dependent Kinases, and Associated Proteins

Research Associate Professors
Timothy A. Johnson, Cardiac Electrophysiology, Real-Time Computer Applications, Digital Signal Processing, Control Theory
Nicholas Moss, Renal Neurophysiology and Pathophysiology
Deborah A. O'Brien, Mammalian Spermatogenesis, Expression of Tissue-Specific Gene Products During Germ Cell Differentiation, Cell-Cell Interactions
Clifford Rinsehart, Molecular Biology of Aging and Immunization, Transcription Factors and Altered Gene Expression in Hormonal Carcinogenesis and Interactions between Stromal and Epithelial Cells

Research Assistant Professors
Oleg Favorov, Somatosensory Cortical Physiology and Neural Network Modeling of Cortical Information Processing
Eric Frey, Nuclear Medicine Imaging, Corrective Reconstruction Techniques in Emission Computer Tomography, Application of High-Speed Computers to Image Reconstruction
Beverly H. Koller, Generating Animal Models of Human Diseases
Cindy Lawler, Neuropharmacology, Brain- Behavior Relationships, Neurotransmitter Receptor Function, Parkinson's Disease, Schizophrenia

The Interdisciplinary Biomedical Sciences (IBMS) Program of the University of North Carolina at Chapel Hill includes faculty from eight departments in the School of Medicine (including Biochemistry and Biophysics, Biomedical Engineering, Cell Biology and Anatomy, Microbiology and Immunology, Pathology and Laboratory Medicine, Pharmacology, and Physiology), one department in the College of Arts and Sciences (Biology), and three curricula (Genetics and Molecular Biology, Neurobiology, and Toxicology). The theme unifying members of these various programs is the pursuit of biomedical science research. The faculty's collective research activities are broad and diverse regarding both scientific endeavors and techniques. Students are able to choose from a variety of preceptors and projects.

A B.S. or B.A. degree is required for admission. The admissions committee considers the perceived benefit a student would receive from participation in this interdisciplinary graduate program. It is generally expected that applicants will have a strong background in the biological sciences, chemistry, physics, mathematics, or engineering (as appropriate for biomedical engineering). Only applicants with both strong academic records and prior research experience will be favorably considered. An application found unsuitable for the IBMS Program will be forwarded to the student's chosen home department or curriculum. This gives the student the opportunity to have his or her application reviewed by two different graduate programs.

Students will acquire a foundation of basic science knowledge, accumulate new laboratory skills required for implementing research goals, and develop the ability to reason scientifically and ask questions/solve problems based in the biomedical sciences. During their first year, students will be required to enroll in graduate-level courses and participate in laboratory research rotations. With the guidance of an advisory committee, students will take courses that embrace an interdisciplinary biomedical science format; they will also take courses that are directly related to their research interests. IBMS students will also be required to enroll in IBMS 301 (Research in IBMS) and IBMS 302 (Seminar in IBMS) each semester of their first year.

Students admitted to the program will be able to choose from more than two hundred faculty members as they pursue the required three research rotations (each about twelve weeks in duration) in the fall and spring semesters of their first year. At the completion of the spring semester, each student will be asked to select an academic adviser (with help from the
advisory committee) who will provide guidance for his or her dissertation research training. The student will then become a graduate student within that adviser’s department or curriculum, officially completing the IBMS membership and becoming subject to the new department’s guidelines.

The stipend for the IBMS Program is consistent with the average stipend in the basic science graduate programs at the University of North Carolina at Chapel Hill. Research fellowships with no teaching requirement will be provided to all students while they are members of the IBMS Program.

Courses for Graduates

IBMS 301 RESEARCH IN INTERDISCIPLINARY BIOMEDICAL SCIENCES (Var.). Prerequisite, enrollment in IBMS program. A research course for IBMS program students to carry on investigations in biomedical science. Fall, spring, Staff.

IBMS 302 SEMINAR IN INTERDISCIPLINARY BIOMEDICAL SCIENCES (1). Prerequisite, enrollment in IBMS program. This course consists of seminars designed to acquaint the student to recent literature in biomedical sciences as it relates to research activity carried on in our departments. Fall, spring, Staff.

SCHOOL OF JOURNALISM AND MASS COMMUNICATION

RICHARD R. COLE, Dean

Professors

Harry Amanu (39) News-Editorial Journalism, Black Press, Minorities and Communication
Richard J. Beckman (40) Visual Communication
John R. Bittner (48) Telecommunication Policy and Law, Broadcast Journalism, Media Management
Margaret A. Blanchard (30) First Amendment Issues, Mass Media History
Thomas A. Bowers (17) Advertising
Jane D. Brown (28) Mass Media Uses and Effects, Health Communication, Qualitative Methods
Richard R. Cole (18) International Communication, Professional Journalism, Mass Communication and Society
Robert F. Lauber (34) Advertising
Thomas R. Lindon (58) Medical Journalism
Philip Meyer (29) Public Opinion, Media Ethics, Newspapers
Donald L. Staw (23) U.S. Newspaper History, Agenda Setting
Richard H. Simpson (52) Broadcast and Corporate Production
Robert L. Stevenson (25) Communication Theory and Research Methods, International Communication
Chuck Stone (49) Censorship, Minorities in the Media, Ethnic Press
John Sweeney (46) Advertising
Ruth Walden (33) First Amendment Theory, Media Law and Ethics
Jan Yopp (42) News-Editorial Journalism, Public Relations

Associate Professors

Debashis Aitak (55) Media Technology
Jesse O. Anthony (38) Visual Communication
George W. Cloud (41) News-Editorial Journalism
Patricia A. Carrin (56) Public Relations
Anne M. Johnston (50) Media Effects, Women and Media, Political Communication
Cathy Packer (57) Mass Communication Law
Carol J. Pardun (57) Public Relations, Advertising
Dulce Sraughan (30) Public Relations
Lucila Vargas (53) International/Development Communication, Women and Media, Qualitative Methods
Xinhua Zhao (47) Advertising and Political Communication in the United States and China

Assistant Professors

Frank Fei (60) Public Journalism, Newspapers
Charles A. Tuggle (59) Broadcast Journalism

Adjunct Professor

Eli A. Rubinstein, Mass Media and Society, Media and Health and Violence, Theory and Methodology

Lecturer


Professors Emeriti

John B. Adams
A. Richard Elam
Raleigh Mann
James J. Mullen
Carol Reuss

The School of Journalism and Mass Communication offers programs leading to the Master of Arts in Mass Communication and the Doctor of Philosophy in Mass Communication.

Admission

Applications are available via the Web through gradschool.unc.edu. Completed forms are submitted to the Graduate School, whose admissions decisions are based largely on recommendations from the School of Journalism and Mass Communication. The minimum criteria for admission to a graduate program in journalism and mass communication are: A recognized undergraduate degree (or equivalent credential from a foreign university). An undergraduate GPA of at least 3.0 (A=4.0) for the last two years of study. Graduate Record Examination (GRE) scores of at least the 55th percentile on the verbal section, 50th percentile on the quantitative section, and 50th percentile on the analytical section. Three letters of recommendation. Forms can be found in the online application. A statement of career intent, indicating how the applicant intends to use graduate education in journalism and mass communication. A current resume. Writing sample. For master’s applicants, this could be an academic paper or magazine or newspaper article; for doctoral applicants, a chapter from their master’s thesis or a copy of an academic paper. Ph.D. applicants should also include a statement that details a problem that they would like to solve during their time as a doctoral student. Applicants are not committed to researching this problem if accepted into the program, but the School of Journalism wants to know their research interests.

Applicants should be aware that the number of applications far exceeds the number of spaces available and that many qualified applicants must be rejected because of limited space in the program.

New students are admitted only for the fall semester. The application deadline is January 1 for the following fall.

Financial Assistance

Park Fellowships are available to ten new doctoral students and fourteen incoming master’s students each year. These fellowships provide handsome stipends, payment of tuition and fees, health insurance, and money for research and travel to professional and academic conferences. The stipend for doctoral students each year is $18,500, and master’s students receive a $10,000 annual stipend. Doctoral student funding is for three years, and master’s student funding lasts for two years. Continuation of funding is dependent on satisfactory progress in the program. In return for this funding, doctoral and master’s students must work as graduate assistants. These
are fifteen-hour work weeks, and assignments vary according to the needs of the faculty and interest and skill levels of the students. The Park Fellowships are available only to United States citizens. There is no special application for these fellowships. All U.S. citizens qualified for admission to the program are considered for Park Fellowships. Finalists will be invited to participate in interviews.

Any graduate student who receives any funding for his or her education from a school-based source is required to maintain at least a 3.0 average each year. This applies to both master’s and doctoral students. Grades are reviewed each spring in order to make this determination. L grades must be balanced by H grades in order to maintain this average. If a student gets an L in one of the core courses, he or she must pass a comprehensive examination given during the following semester. If the student fails the exam, he or she will be allowed to retake the course once. The student cannot have the first L removed from his or her transcript by passing the examination or by getting a P upon retaking the course. If the student again earns an L after retaking the course, he or she will not be allowed to continue in the program.

The school has limited funds available for thesis or dissertation research through the Minnie S. and Eli A. Rubinstein awards. The school also offers continuing students an $8,000 scholarship, named after North Carolina journalist William F. Clingman, for the study of ethics and a $1,000 Tom Wicker Scholarship with preference for news-editorial students.

The Master’s Program

The master’s program has two major sequences. The professional sequence is designed to educate students for professional careers in public relations, advertising, journalism, and certain related mass communication fields. The mass communication sequence gives students the background needed for teaching or research. In both sequences, students are taught to critically examine the role of mass communication in society and are provided with a firm grounding in theory and analysis. By setting high standards for both scholarly and professional achievement, the school seeks to prepare graduates to be leaders and critical thinkers, no matter what career paths they might take.

The M.A. is designed to meet the needs of (1) holders of the bachelor’s degree in fields other than journalism-mass communication who wish to enter the field, (2) journalists who want more education in a specialized field, (3) experienced journalists or communicators who wish to prepare themselves for teaching, (4) individuals primarily interested in education for media research, and (5) journalism-mass communication graduates who wish to continue their education and career development.

In other words, this is not strictly a professional master’s program that aims to hone technical skills in writing, editing, photography, and graphic design. Nor is the focus solely academic and theoretical. Rather, the school seeks to achieve a balance.

Path Options

Early in the program, each master’s student, with his or her adviser, designs a path of courses that leads to a coherent goal. The path is usually determined by a career interest and includes courses numbered 100 and above both inside and outside the school. Students in the professional sequence take at least one 300-level seminar and those in the mass communication sequence take two seminars. All of the path courses are evaluated for consistency with the thesis, series of articles, or project that the student does as the capstone for the M.A. work.

Some examples of paths in the professional sequence:

- Students preparing for careers leading to management and research positions in advertising may choose courses in advertising management and planning, research, new technologies, sales, or some other area. Courses from business, psychology, sociology, and library and information science are suggested as outside courses.
- For careers in writing and editing for the print media, students choose courses that teach the relevant skills. They also learn the theory and analytical skills they need to eventually hold leadership positions in their chosen fields.
- Public relations students prepare for careers leading to management positions in corporations, non-profit organizations, government, or public relations agencies. Their paths include skills and theory courses in public relations as well as outside areas of interest, including business, organizational and speech communication, and health communication.
- Other fields for which professional paths can be designed include visual communication, electronic communication, online editing, and computer-assisted reporting.
- Paths in the mass communication sequence can be just as diverse. Students learn the theory and research methods they need to teach at a small college or to pursue a doctorate in mass communication. They can study mass communication law or history, media effects, new communication technologies, or international communication, among other subjects. Depending on the course of study they select, they may also be prepared for a variety of research positions in the public and private sectors. Students in this sequence do not take professional skills courses such as newswriting and editing.

Requirements

Master’s students must earn at least thirty graduate-level credits (10 courses numbered 100 or above) including three credits for a thesis or non-traditional thesis option. Course requirements are divided into three categories: basic competencies, core courses, and path courses. At least six courses (including the thesis or thesis option) must be numbered 200 or above. This includes a research methods course, generally JOMC 210 or 211, appropriate to the thesis or thesis option. Two to four of the graduate-level courses should be taken from other University departments. Students may select from courses offered by other departments or schools at UNC-Chapel Hill, Duke University, and North Carolina State University.

Basic Competencies: All master’s students must pass the School’s spelling and grammar test by the end of the first semester. This exam is a basic requirement for graduation for our undergraduate students and normally poses no major problems for graduate students. Information on the spelling and grammar test, including instructions on how to study for it, is included in the orientation packet sent to new students each summer.

Master’s students also must demonstrate competency in other basic skills related to their chosen paths. For example, students seeking news-editorial careers must demonstrate competency in newswriting and editing, plus in one related area such as reporting, photography, graphic design, or feature writing. Regardless of sequence, three competency courses are required, and no credit is given toward the degree. Competency courses may be at any level, including undergraduate. Occasionally students may instead pass exemption exams that are traditionally given during the orientation period.

Core Courses: All master’s students must take Mass Communication Research Methods (JOMC 281) and Mass Communication Law and Ethics (JOMC 264).

If a student receives an L in either core course, he or she must pass a comprehensive examination given during the second semester. If the student fails the exam, he or she must retake the course. If the student again makes an L, he or she will not be allowed to continue in the program.
**Path courses:** The master’s program is designed to allow students, under the direction of their advisors, to design a course of study that addresses their research and skills interests. This path may be along traditional sequence lines, i.e., advertising, news-editorial, public relations, or integrated to provide a more convergent program of study, i.e., integrated marketing communications, strategic communications. Regardless of the sequence or path, each student must define a coherent theme connecting courses in the School of Journalism and Mass Communication and outside the school and those courses must be appropriate to the thesis.

All students must pass the appropriate examinations, which include a comprehensive written examination covering the material in the student’s path courses, given at the completion of course work, and an oral examination on the thesis or professional project, given by the student’s advisory committee.

M.A. students must complete the degree within five years of admission to the program. Students who do not finish within five years may petition for an extension.

**Thesis, Articles, or Project**

In the mass communication sequence, students must do a traditional research thesis. In the professional sequence, students have the option of writing a thesis or presenting a professional-quality series of articles or project. This non-traditional thesis option requires the same effort and professionalism as the thesis. In addition to the professional product itself, the non-traditional thesis option requires an extensive review of the literature and statement of methods.

Students enroll in Master’s Thesis, JOMC 393, or Non-Traditional Thesis Option, JOMC 392, for three credits as they write the thesis or the professional equivalent. A maximum of three thesis credits can be counted toward the 30 credits required for the M.A.

**Length of Program**

Most students complete the master’s program in two years, typically attending classes full time during three consecutive semesters and completing the thesis, articles, or project in the fourth semester. Some students take a semester off to work as interns in other cities; others stay on over the summer to complete course work or their theses, articles, or special projects. Although it is possible to complete the degree by taking classes part time, the school does not recommend it.

**Graduate Committee**

To gain the most from the program, students should select a three-member advisory committee early. Led by a member of the school’s graduate faculty who serves as the student’s adviser, the committee acts as a resource as well as referee of the thesis, articles, or special project. One member of the committee should be from outside the school with whom the student has taken a course.

**Master’s in Medical Journalism**

The aim of the Master of Arts Program in Medical Journalism is to teach the skills needed to work as a medical journalist in both print and electronic media. Students will also gain the knowledge and background necessary to pursue further research in medical journalism.

**Requirements**

Master’s students in medical journalism must earn at least thirty graduate-level credits (ten courses numbered 100 or above) including three credits for a thesis or special project. Course requirements are divided into five categories: basic journalism and mass communication competencies, core medical journalism courses, related public health and other pertinent courses, core journalism and mass communication courses, and advanced journalism and mass communication courses.

**Basic Competencies:** All master’s students must pass the school’s spelling and grammar test by the end of their first semester. This is a basic requirement for graduation for undergraduate students and normally poses no major problem for graduate students. Information on the spelling and grammar test, including instructions on how to study for it, is included in the orientation packet sent to new students each summer. All master’s students in medical journalism must either test out of JOMC 53, Newswriting, at the beginning of their first semester, or take the course that semester. All students must also take two more basic competency courses, such as JOMC 54, Reporting, or JOMC 57, Editing.

**Core Medical Journalism Courses:** JOMC 195, Medical Journalism, and JOMC 196, Medical Reporting for the Electronic Media.

**Related Public Health and Other Pertinent Courses:** EPID 160, Principles of Epidemiology; either ENV 101, Environmental Health, or HPA 220, Evolution, Organization and Financing of the U.S. Health System; and a third course outside the School of Journalism and Mass Communication in a pertinent discipline. The course must be approved by the director of the program in medical journalism.

**Core Journalism and Mass Communication Courses:** JOMC 201, Mass Communication Research Methods, and JOMC 264, Mass Communication Law and Ethics. If the student makes an A in either course, he or she must pass a comprehensive examination during the second semester. If the student fails the exam, he or she must retake the course. If the student again makes an A, he or she will not be allowed to continue in the program.

**Advanced Journalism and Mass Communication Courses:** One more JOMC 100-level or above course, and one JOMC 300-level seminar.

**Thesis, Project, or Articles**

Master’s students in medical journalism have the option of writing a traditional thesis (JOMC 393) or doing a non-traditional thesis project (JOMC 392). Examples of projects include preparing a broadcast-quality television or radio report; writing a series of medical journalism articles suitable for publication in a magazine, newspaper, or Web-based format; or preparing a medical journalism multimedia project.

**Length of Program**

Students will complete the master’s program in two years by attending classes full time during the first three consecutive semesters and then completing the thesis or project during the fourth semester. There is no provision for part-time students in the master’s program in medical journalism.

**Graduate Committee**

Students select a three-member advisory committee. Headed by the director of the medical journalism program or another appropriate professor who serves as the student’s adviser, the committee acts as a resource as well as referee of the thesis or project. One member of the committee should be from outside the school, preferably from a health- or science-related discipline with whom the student has taken a course.

**Ph.D. Program**

The Ph.D. in mass communication is designed to prepare students for college teaching and research positions or research careers in mass communication industries, advertising agencies, market or opinion research firms, busi-
ness, or government. The school works closely with each student to develop a program of study that is both interdisciplinary, allowing the student to take full advantage of the University's rich academic offerings, and tailored to meet the specific needs and interests of the student. The goal of the program is to produce outstanding scholars who are highly knowledgeable about mass communication and highly skilled as researchers.

The program is small and very selective; about twelve to fourteen students are admitted each year. Admissions decisions are based not only on the standard criteria described elsewhere in this catalog - GRE scores, grade averages, and letters of recommendation — but also on a determination of whether the applicant's interests and goals fit with those of the program and faculty. For that reason, the statement of purpose and statement of research interests that must accompany an application to the Graduate School are extremely important, and applicants are encouraged to be as specific as possible in outlining their research interests and career goals.

Requirements

Ph.D. students are required to develop 1) a broad understanding and knowledge of mass communication in modern society, 2) expertise in two areas of specialization in mass communication and 3) competence in an appropriate research methodology. Students have considerable flexibility in designing their programs around a core of four courses, which should be taken during the first year of study. The four core courses are Mass Communication Research Methods (JOMC 201), Readings in Mass Communication History (JOMC 242), Theories of Mass Communication (JOMC 243), and Mass Communication Law and Ethics (JOMC 264). If a student receives an L in any core course, he or she must pass a comprehensive examination given during the second semester. If the student fails the exam, he or she must retake the course. If the student again makes an L, he or she will not be allowed to continue in the program. Forty-eight graduate credits (100-level and above courses), in addition to at least six dissertation credits, are required for the Ph.D. Those forty-eight hours must be divided into three groups of courses: a major area of study, consisting of at least fifteen credits; a minor area of study, consisting of no more than twelve credits; and research methods, consisting of at least six credits. Major and minor areas of study include, but are not limited to, such fields as communication effects, communication and society, international communication, history of mass communication, communication law and policy, public opinion, and communication technology; and must come from the list of approved research streams set by the program. The research methods a student chooses to study must be appropriate to the student's area of specialization and dissertation topic.

Other requirements include:

- At least twenty-four credits of 200 and 300 level courses within the School of Journalism and Mass Communication;
- Satisfactory performance on written and oral comprehensive exams;
- At least four semesters in residence, with a minimum of two semesters in continuous study at UNC-Chapel Hill;
- Successful completion and oral defense of a dissertation.

Length of Program

Students normally spend two years taking courses, then devote one semester to preparing for comprehensive exams and writing the dissertation proposal. After the proposal is approved by the student's doctoral committee, the dissertation must be completed and defended. The nature of the dissertation research will govern the length of time a student spends on the project, but many students find it takes about one year to complete a dissertation. In general, it takes three years - and often more - to complete the Ph.D. The Graduate School requires students to complete the degree within eight years of entry into the program. Students who do not finish within eight years may petition for an extension.

Doctoral Committee

Each Ph.D. student selects a five-member supervisory committee, which is approved by the director of graduate studies. This committee consists of three School of Journalism and Mass Communication faculty members and two graduate faculty members from outside the school. The student's adviser serves as chair of the committee. The committee should consist of professors with whom the student has taken courses. The committee guides the student's academic development, administers and evaluates the comprehensive exams, and approves the dissertation proposal and dissertation.

Courses for Graduates and Advanced Undergraduates

102 MASS COMMUNICATION EDUCATION IN HIGH SCHOOL (3).
Readings, discussion, and projects fostering excellence in teaching journalism/mass communication in the high school, from philosophy and practice to professional skills. Staff.

103 MASS COMMUNICATION LAW IN HIGH SCHOOL (3).
Application of First Amendment speech and press freedoms to secondary school media, including libel, privacy, access to information, journalistic privilege, prior restraint, advertising and broadcast regulation and ethical practices. Staff.

104 MASS COMMUNICATION WRITING AND EDITING IN HIGH SCHOOL (3).
High school journalism teachers and advisers learn to teach the skills journalists need to communicate. Emphasis on writing and thinking skills necessary to convert information into clear messages. Staff.

105 DESIGN AND PRODUCTION OF SCHOOL PUBLICATIONS (3).
High school journalism teachers and advisers learn to teach the skills journalists need to produce publications. Designed for persons with no background in design. (Note: Degree-seeking students may not use both JOMC 85 and 105 to complete degree requirements.) Staff.

111 MINORITIES AND COMMUNICATION (3).
An examination of racial stereotypes and minority portrayals in U.S. culture and communication. Emphasis is on the portrayal of Native Americans, African Americans, Hispanics, and Asian Americans in the mass media. Amana.

112 THE BLACK PRESS AND U.S. HISTORY (AFAM 112) (3).

115 WOMEN AND MASS COMMUNICATION (WMST 115) (3).
An examination of women as media producers, subjects, and audiences with a focus on current practices and possibilities for change. Johnston, Vargas.

120 INTRODUCTION TO VIDEO PRODUCTION AND EDITING (3).
Prerequisites, JOMC 21 and permission of the instructor. Project-based, hands-on advanced video production course giving close attention to refining creative and technical skills while preparing media programs. Students create and produce professional-quality video projects. Simpson.

121 ELECTRONIC JOURNALISM (3).
Prerequisites, JOMC 21, 120, and permission of instructor. Examination and application of in-depth broadcast news reporting techniques, especially investigative reporting, special events coverage, and the documentary. Students film and produce radio and television programs of actual news events. Bitner, Tuggle.

122 PRODUCING TELEVISION NEWS (3).
Prerequisites, JOMC 120 and 121, and permission of instructor. Students work under faculty guidance to produce "Carolina Week," a television news program, and are responsible for all production tasks: producing, reporting, anchoring, directing, and graphics. Tuggle.
124 ELECTRONIC MEDIA REGULATION AND POLICY (3). Survey of the history of communication technology from the telegraph to the Internet, with an emphasis on the regulatory framework that surrounded each medium and policy implications for the future. Bitner.

130 PRINCIPLES OF PUBLIC RELATIONS (3). Internal and external public relations concepts and practices for businesses and other organizations, with emphasis on identification and analysis of their publics and design, execution, and assessment of appropriate communication strategies. Boynton, Curtin, Lamb, Pardun, Sraughan.

131 CASE STUDIES IN PUBLIC RELATIONS (3). Prerequisite, JOMC 130. Analysis of public relations practices, including planning, communication, evaluation exercises, and management responsibilities. Boynton, Curtin, Lamb, Pardun, Sraughan.

132 PUBLIC RELATIONS WRITING (3). Prerequisites, JOMC 53 and 130. Education and practice in communication skills required of public relations practitioners. Boynton, Curtin, Lamb, Sraughan.

133 CORPORATE VIDEO COMMUNICATION (3). Prerequisite, JOMC 130. Introduction to the use of video as a means of communication with a variety of an organization's internal and external publics. Simpson.

134 PUBLIC RELATIONS CAMPAIGNS (3). Prerequisites, JOMC 131 OR 132. Capstone course that builds on concepts and skills from earlier courses. Students use formal and informal research methods to develop a strategic plan, including evaluation strategies for a client. Fall and spring. Boynton, Curtin, Lamb, Pardun, Sraughan.

140 CURRENT ISSUES IN MASS COMMUNICATION (3). Analysis of the interrelationships between U.S. mass media and the society that they serve. Brown, Gibson, Vargas.


144 CENSORSHIP (3). Its history, conflicting philosophies, and practice through politics, government, ethnicity, religion, pressure groups, the media, and the law with emphasis on events and personalities. Stone.

145 PROCESS AND EFFECTS OF MASS COMMUNICATION (3). Mass communication as a social process, incorporating literature from journalism, social psychology, sociology, political science, and history. Acquaints students with factors in message construction, dissemination, and reception by audiences. Brown, Shaw, Stevenson.

146 INTERNATIONAL COMMUNICATION AND COMPARATIVE JOURNALISM (POLI 146, COMM 159) (3). Development of international communication; the flow of news; the role of communication in international relations; communication in developing nations; comparison of press systems. Stevenson, Vargas.

149 INTRODUCTION TO INTERNET ISSUES AND CONCEPTS (3). Students develop an understanding of social, legal, political and other issues related to access to and use of the Internet. Offered online. Alkat.

154 ADVANCED REPORTING (3). Prerequisites, JOMC 53 and 54. Rigorous, in-depth instruction and critiques of students' news and feature assignments done with different reporting methodologies: interviewing, official records, direct and participant observation, and survey research (the Carolina Poll). Alkat, Meyer.

156 MAGAZINE WRITING (3). Prerequisites, JOMC 53 and 56. Instruction and practice in planning, writing, and editing copy for magazines. Stone.

157 ADVANCED EDITING (3). Prerequisite, JOMC 57. Concentration on the editing and display of complex news and feature stories and other print media content with a significant emphasis on newspaper design and graphics. Cloud, Fee.

160 FREEDOM OF EXPRESSION IN THE UNITED STATES (3). An examination of the development of freedom of expression in the United States within the context of the nation's history. Blanchard.

170 PRINCIPLES OF ADVERTISING (3). A survey of the economics, psychology, philosophy, and history of advertising, with particular reference to research bases, copy, layout, media planning, production, and testing of advertisements. Bowers, Hester, Lauterborn, Pardun, Sweeney.

171 ADVERTISING COPY AND COMMUNICATION (3). Prerequisites, JOMC 53, 170 or equivalent, and permission of the school. Application of findings from social science research; social responsibility of the copywriter and advertiser; preparation of advertisements for the mass media; and research in copy testing. Hester, Lauterborn, Sweeney.

172 ADVERTISING MEDIA (3). Prerequisites, JOMC 53 and 170 or equivalent. The media-planning function in advertising for both buyers and sellers of media; the relationships among media, messages, and audiences; computer analysis. Bowers, Zhao.

173 ADVERTISING CAMPAIGNS (3). Prerequisites, JOMC 53 and 171 or 172. Planning and execution of advertising campaigns, types and methods of advertising research, and the economic function of advertising in society. Lauterborn.

174 SPORTS MARKETING AND ADVERTISING (3). Examines the range of promotional techniques being used in the modern sports industry. Topics include sponsorships, advertising, merchandising, and the effects of commercialization. Sweeney.

175 CONCEPTS OF MARKETING (3). Designed for students anticipating careers in advertising, public relations, or related areas, this course teaches the vocabulary and basic concepts of marketing as it will be practiced, emphasizing the role of mass communication. Lauterborn.

176 ADVANCED ADVERTISING COPYWRITING (3). Prerequisites, JOMC 53, 170 or equivalent, 171 and permission of the instructor. Rigorous, in-depth instruction and critiques of student advertising writing. Sweeney.

178 RETAIL ADVERTISING (3). Prerequisites, JOMC 53 and 170 or equivalent. Principles and practices of retail advertising in all media, with emphasis on selling, writing, and layout of retail advertising for the print media. Bowers.

179 ADVERTISING AND PUBLIC RELATIONS RESEARCH (3). Prerequisites, JOMC 130 or 170. Critical understanding and application of quantitative methods used in the strategic planning and evaluation of advertising and public relations campaigns. Curtin, Zhao.

180 ADVANCED PHOTOJOURNALISM (3). Prerequisites, JOMC 80 and 53, or take 53 concurrently. Advanced course in black and white photojournalism, concentrating on the newspaper and magazine picture story, advanced camera and darkroom techniques, and picture editing. Beckman, Davison.

181 DOCUMENTARY PHOTOJOURNALISM (3). Prerequisite, JOMC 180 and permission of instructor. Students study and produce work on the social documentary tradition of photography. Beckman, Davison.

185 PUBLICATION DESIGN (3). Prerequisites, JOMC 85 and 53, or take 53 concurrently, and permission of instructor. Detailed study and application of graphic design techniques in magazines, newspapers, advertising, and corporate communication. Anthony.

186 PROMOTION DESIGN (3). Prerequisites, JOMC 85 and permission of instructor. Study and application of graphic design and promotional techniques to creating advertisements and other marketing materials. Practice in conceiving and executing finished layouts and graphics. Anthony.
187 INFORMATION GRAPHICS (3). Prerequisite, JOMC 85. Detailed study and application of graphic design and information-gathering techniques to creating charts, tables, diagrams, icons, and maps. Practice in visually presenting information with clarity and originality. Anthony.

188 CYBERCASTING AND CYBERPUBLISHING (3). Prerequisites, JOMC 88 and permission of instructor. Issues and applications in cybercasting and cyberpublishing. Class will create, cyberpublish and cybercast projects on the Internet while exploring the effective use of Internet technologies and current issues. Fall and spring. Beckman, Jones.

189 MULTIMEDIA DESIGN AND PRODUCTION (3). Prerequisites, JOMC 88 and permission of instructor. Advanced course in which students blend a variety of story-telling media into journalistic multimedia products. Students design and produce projects combining photography, audio, video, type and informational graphics. Beckman.

191 PROSEMINAR IN CONTEMPORARY MASS COMMUNICATION (1-3). Small classes on various aspects of journalism and mass communication with subjects and instructors varying each semester. Staff.

195 MEDICAL JOURNALISM (3). Prerequisites, JOMC 53 or permission of instructor. Prepares students to work as medical journalists for a variety of media, including print, broadcast, and the Internet. The course emphasizes writing skills and interpreting medical information for consumers. Linden.

196 MEDICAL REPORTING FOR THE ELECTRONIC MEDIA (3). JOMC 195 or permission of instructor. Teaches students how to conceive, script, report, and produce medical stories for electronic media, especially television. Students work in teams to produce projects for professional media outlets. Linden.

Courses for Graduates

201 MASS COMMUNICATION RESEARCH METHODS (3). Intensive study of mass communication research methods (experiment, survey, content analysis, and historiography), including computer applications, statistics, theory development, and trends in the published literature. Required of all graduate students. Meyer.

202 MASS COMMUNICATION PEDAGOGY (3). Investigation of college teaching and academic life, including course planning, syllabus preparation, interpersonal skills, presentation modes, evaluation, and balancing teaching with other expectations. Bowers.

210 QUALITATIVE METHODS FOR MASS COMMUNICATION RESEARCH (3). Survey of naturalistic methods applied to mass communication research, including ethnography, in-depth interviews, life histories, and test-based analysis. Curtin, Vargas.

211 STATISTICS FOR MASS COMMUNICATION RESEARCH (3). Prerequisite, JOMC 201. Statistics with emphasis on application to studies in mass communication. Prior knowledge of statistics and familiarity with computer software are NOT assumed. Stevenson, Zhao.

242 READINGS IN MASS COMMUNICATION HISTORY (3). Directed readings in mass communication history. Required of Ph.D. students. Blanchard.

245 THEORIES OF MASS COMMUNICATION (3). Students prepare analytical papers on theories of mass communication based upon extensive review of behavioral science literature. Required of Ph.D. students. Brown, Curtin, Fee, Shaw.

250 MEDIA MANAGEMENT (3). A study of planning policy functions related to media management concerns. Staff.

254 SPECIALIZED REPORTING (3). Prerequisite, JOMC 54 or permission of instructor. Reporting of complicated topics, using in-depth backgrounding, investigative reporting techniques, story conferences and documents, and other research data. Required of news-editorial master's students who plan to complete the articles option. Meyer.

264 MASS COMMUNICATION LAW AND ETHICS (3). Intensive study of press freedom and the First Amendment, including libel, privacy, access to information, free press-suit trial, advertising and broadcast regulation, journalistic privilege, prior restraint. Packer, Walden.

301 SEMINAR IN MASS COMMUNICATION RESEARCH METHODS (3). Prerequisites, JOMC 201 or equivalent, and permission of instructor. Advanced work in quantitative data analysis and research preparation. Stevenson, Zhao.

302 SEMINAR IN MEDIA ANALYSIS (3). Students participate in the design and execution of a media research project. Staff.

330 SEMINAR IN PUBLIC RELATIONS (3). Readings, discussions, and research in public relations. Curtin, Straughan.

340 SEMINAR IN MASS COMMUNICATION AND SOCIETY PERSPECTIVES (3). Readings, discussion, and papers on the roles and responsibilities of mass communication in society. Johnston.

342 SEMINAR IN MASS COMMUNICATION HISTORY (3). Readings, discussion, and projects in mass communication history. Fall. Birtner, Blandard, Shaw.

346 SEMINAR IN INTERNATIONAL COMMUNICATION (Political Science 346) (3). Prerequisite, JOMC 146 or permission of instructor. Reading and research in selected topics. Focus in recent years has included global news flows, communication and social change, communication in the collapse of communism, Western dominance in international communication, global culture, and influence of technology. Stevenson, Vargas.

347 SEMINAR IN COMMUNICATION FOR SOCIAL CHANGE (3). Examines how grassroots and participatory strategies are being combined with communication technologies to promote social change in Third World settings of developed and developing nations. Vargas.

360 SEMINAR IN DEVELOPMENT OF FIRST AMENDMENT FREEDOMS (3). Readings and discussions about development of and interrelationships among the First Amendment freedoms of speech, press, assembly, petition, association, and religion. Blanchard.

364 SEMINAR IN MASS COMMUNICATION LAW AND ETHICS (3). Prerequisite, JOMC 264 or permission of instructor. Readings, discussion and projects in major issues of mass communication law, including libel, privacy, access, court-press relations, the First Amendment, and regulation of telecommunications. Spring. Packer, Walden.

370 SEMINAR IN SOCIAL AND ECONOMIC PROBLEMS IN ADVERTISING (3). Readings, discussion, and papers on advertising as a social and economic force in contemporary society. Bowers, Pardun.

379 SEMINAR IN ADVERTISING RESEARCH (3). Readings and discussion examining theories underlying advertising and the testing of those theories through research projects. Zhao.

390 READING AND RESEARCH (3). Prerequisite, permission of instructor. Advanced reading or research in a selected field. Staff.

391 SPECIAL TOPICS SEMINAR (3). Seminar on various aspects of mass communication with content and instructors varying each semester. Staff.

392 NON-TRADITIONAL THESIS OPTION (3). Preparation of a master's degree paper or project that focuses on professional practice in the field. Staff.

393 MASTER'S THESIS (3). Staff.

394 DOCTORAL DISSERTATION (total of 6 or more). Staff.
DEPARTMENT OF LINGUISTICS

RANDALL J. HENDRICK, Chair

Advisory Committee:
Professors P. Gordon, R. Hendrick, L. Janda, L. King, W. Lycan, C. Maley, P. Roberge, J. Thompson; Associate Professor G. Wébelhuth

Professors
Randall Hendrick (11) Syntax, Celtic Linguistics
H. Craig Melchert (10) Indo-European Linguistics, Chinese Linguistics

Associate Professor
Gert Wébelhuth (12) Syntax, Morphology, Germanic Linguistics, Discourse, Comparative Linguistics

Assistant Professors
Henry Gerfen (15) Phonetics, Phonology, Amerindian, Language Acquisition
Jennifer L. Smith (7) Phonology, Phonetics, Japanese

Associated Faculty
Connie Edle, English Linguistics
Lawrence Feinberg, Slavic Linguistics
Peter C. Gordon, Psychology of Language
Robert D. Greenberg, Balkan, South Slavic Linguistics, Dialectology
Laura Janda, West Slavic Linguistics
Larry D. King, Spanish and Portuguese Linguistics
William Lycan, Philosophy of Language
Catherine Maley, Romance Linguistics
Edward D. Montgomery Jr., Romance Linguistics and Philology
Patrick O'Neill, Celtic Languages
Paul Roberge, Historical Linguistics, Germanic Linguistics, Pidgins and Creoles

The Department of Linguistics, comprised of specialists teaching core courses as well as faculty from nearly a dozen different departments, offers graduate work leading to the degrees of Master of Arts and Doctor of Philosophy in Linguistics.

Degree candidates must demonstrate both a basic knowledge of the field of linguistics as a whole and the ability to do independent study in a chosen specialty. Basic knowledge of linguistics is acquired by taking certain required courses; knowledge of a specialty is gained through elective courses as well as by writing a thesis.

The elective courses are expected to form a coherent program in a sub-field of linguistics (e.g., phonology, syntax, historical linguistics, sociolinguistics) or in the application of linguistics to a closely related discipline (e.g., anthropology, study of a particular language or language family). To this end, each student, after consultation with the director of Graduate Studies, will by the beginning of the second semester of residence choose a permanent advisor, who will supervise the student's program of study. Degree programs must satisfy the general requirements of the Graduate School. In addition, the student must fulfill the following curriculum requirements.

Master of Arts in Linguistics

Course requirements: Linguistics 100, 101, 120, 123, 130, four courses within a chosen specialty (selected with guidance of the graduate director), and three hours of thesis credit. A student seeking transfer credit for graduate courses taken at another institution must make a formal request to the director of Graduate Studies, who, after consultation with the instructor of the corresponding course, may recommend acceptance of the transfer credit. A maximum of six semester hours may be so transferred.

Foreign language requirement: Reading knowledge of one foreign language. For students in historical linguistics, French or German is recommended.

Comprehensive examination: The M.A. comprehensive examination, normally taken in the fall of the second year of graduate study, will consist of a three-part written examination covering the areas of phonology, syntax, and historical linguistics. The examination will be based on the required courses and a reading list published by the department. A follow-up oral examination may involve residual questions from the written examination but centers primarily upon the topic the student proposes for his or her M.A. thesis. Upon completion of the thesis the student defends his or her work in the final oral examination.

A student who wishes to bypass the M.A. degree must submit a written request to the chair of the department after the M.A. comprehensive examination. The linguistics faculty will consider the request, and the student will be informed, in writing, of the decision.

Doctor of Philosophy in Linguistics

Course requirements: fifty-one credit hours, of which three hours will be dissertation credit. Courses stipulated for the M.A. are required. Either linguistic field work (Linguistics 293) or an approved philology course (see list of specific language groups) must be taken; in addition, at least one advanced methods course at the 200 level and a course on the history of linguistics. Students in historical linguistics should take one year of a classical language such as Latin, Greek, or Sanskrit.

Foreign language requirements: (a) all students must complete one year of a non-Indo-European language, or one semester on the structure of a non-Indo-European language; (b) students in historical linguistics must demonstrate a reading knowledge of French and German; other students must demonstrate a reading or linguistic knowledge of any two foreign languages, one of which may be taken under (a).

Preliminary examination: For students who have taken the M.A. degree in the department, the M.A. written comprehensive examination just described will also serve as a diagnostic preliminary examination to assist in determining the student's capability for Ph.D. work and in planning the program of study. For the same purpose, students who enter the program at the Ph.D. level will, upon completion of nine hours of course work, also take the same preliminary examination.

The Ph.D. written comprehensive examination consists of three essays, one each from the areas of phonology, syntax, and historical linguistics. While each of these essays may present original research, it is expected that at least one of these papers be a substantial research paper demonstrating the candidate's ability to conduct original research. The topics of these are approved by the respective specialists in each area. The essays may be submitted at any time between the passing of the preliminary examination and the completion of course work. Details concerning the essays may be obtained from the director of Graduate Studies.

Following successful completion of the written comprehensive examination, the student will undergo an oral examination focusing primarily but not exclusively on the student's dissertation prospectus (a detailed proposal prepared by the student with the guidance of his or her advisor). The oral examination committee consists of five faculty members who remain members of the dissertation committee until the student has successfully defended the completed dissertation.

The department recommends up to a maximum of two years of financial support for M.A. candidates and up to three years of support beyond the M.A. for doctoral candidates, but such support is always contingent upon satisfactory progress as a graduate student and satisfactory performance if the stipend requires service. Research assistantships, language laboratory assistantships, teaching assistantships for linguistics courses, and University nonservice awards are available. Students proficient in a foreign language
are eligible for teaching assistantships in German, French, Italian, Spanish, and other languages. Application for financial support is made in conjunction with application for admission to the Graduate School.

Further information may be obtained by writing to the Director of Graduate Studies, Department of Linguistics, CB# 3155, Dey Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3155.

Courses for Graduates and Advanced Undergraduates

100 INTRODUCTION TO GENERAL LINGUISTICS (Anthropology 179) (3). An introduction to the scientific study of language. The nature of language structure. How languages are alike and how they differ. Fall. Staff.


104 SYMBOLIC LOGIC (See Philosophy 101) (3).

109 COGNITIVE LINGUISTICS (See Slavic 109) (3).

110 PHILOSOPHY OF LANGUAGE (See Philosophy 110) (3).

115 TOPICS IN LINGUISTICS (3). Directed readings on linguistic topics not covered in specific courses. Fall and spring. Staff.

120 LINGUISTIC PHONETICS (Anthropology 180) (3). Introduction to the general principles of linguistic phonetics: anatomy of vocal tract, physiology of speech production, universal phonetic theory. Practice in the recognition and transcription of speech sounds. Fall. Gerfen.

123 PHONOLOGY I (Anthropology 183) (3). Prerequisites, Linguistics 100 or equivalent and Linguistics 120. Introduction to the principles of modern generative phonology. Methods and theory of phonological analysis. Spring. Gerfen.


127 MORPHOLOGY (3). Prerequisite, Linguistics 30, 100, or permission of the instructor. Cross-linguistic investigation of internal word structure: inflection and derivation, word formation rules versus affixation, autosegmental morphology, morphoskeletal and morphophonemic rules, and the interaction of morphology with phonology and syntax. (On demand.)

130 SYNTAX I (Anthropology 190) (3). Prerequisite, Linguistics 100 or consent of the instructor. Methods and theory of grammatical analysis within the transformational generative framework. Special emphasis on analyzing syntactic and semantic structures of English. Fall. Hendrick, Weihehruth.

133 SYNTAX II (Anthropology 193) (3). Prerequisite, Linguistics 130 or equivalent. Methods and theory of grammatical analysis, with special reference to transformational grammar. Spring. Hendrick, Weihehruth.

137 SEMANTICS (3). Prerequisite, Linguistics 30, 100, or permission of the instructor. Semantics as a part of linguistic theory: core-and-disjunct reference among nominals, "crossover" phenomena, quantifier scope, lexical semantics, Montague Grammar and compositional semantics, and explanatory universals in semantic theory. (On demand.) Hendrick, Weihehruth.

139 THE LANGUAGE OF TIME (3). Prerequisite, Linguistics 30, 100, or permission of the instructor. The representation of time and temporal relations in natural languages. Cross-linguistic study of tense and aspect distinctions, modality, temporal adverbials, temporal anaphora, and sequences of tenses. (On demand.) Hendrick.

140 MATHEMATICAL LINGUISTICS (3). Introduction to topics in logic, set theory, and modern algebra with emphasis on linguistic application. Automata theory and the formal theory of grammar with special reference to transformational grammars. No previous mathematics assumed. (On demand.) Staff.

142 INDO-EUROPEAN CULTURE AND SOCIETY (Folklore 143) (3). Survey of nonmaterial aspects of Indo-European society recoverable by linguistic reconstruction, including law, religion, economics, poetics. Review of the Utheman problem. No knowledge of comparative grammar is assumed. (On demand.) Melchert.

145 LANGUAGE AND MIND/LINGUISTICS AND THE BRAIN (3). Prerequisite, Linguistics 30, Linguistics 100, Philosophy 35, English 36, or permission of the instructor. The course treats the relationship among linguistics, artificial intelligence, neurobiology, cognitive psychology, and the philosophies of mind, language, and science. (On demand.)

147 LANGUAGE DEFICITS AND COGNITION (3). Prerequisites, Linguistics 30 or permission of instructor. Survey of the linguistic properties associated with aphasia, autism, Williams Syndrome dyslexia, and schizophrenia. Emphasis on the implications of these conditions for theories of mind. Spring. Hendrick.

150 INTRODUCTION TO INDO-EUROPEAN PHONOLOGY (3). A survey of the phonological systems of the major Indo-European languages and their development from Proto-Indo-European. Fall. (Alternate years.) Melchert.

151 INTRODUCTION TO INDO-EUROPEAN MORPHOLOGY (3). Prerequisite, Linguistics 150 or permission of the instructor. Introduction to the major morphological categories in the Indo-European languages and their development from the proto-language. Spring. (Alternate years.) Melchert.

161 NATIVE LANGUAGES OF THE AMERICAS (3). Prerequisites, Linguistics 30 or 100 or permission of the instructor. This course explores the phonological and morphological structure of selected Amerindian languages indigenous to the Americas. Emphasis is on the linguistic analysis of original as well as published primary data. Fall, spring. Gerfen.


164 HISTORY OF THE FRENCH LANGUAGE (See French 126) (3).

165 FRENCH PHONETICS AND PHONOLOGY (See French 145) (3).

166 STRUCTURE OF MODERN FRENCH (See French 146) (3).

170 SOCIO-LINGUISTICS (Anthropology 171) (3). Prerequisite, Linguistics 30, 100, or permission of the instructor. Introduction to the study of language in relation to society: variation as it correlates with socioeconomic status, region, gender, the social motivation of change; language and equality; language maintenance, planning, shift. Spring. Reberge, King.

172 PIDGINS AND CREOLES (German 172, Anthropology 192) (3). Examination of the linguistic features of pidgin and creole languages, the sociohistorical context of their development, and their impact for current theoretical issues (acquisition, universals, language change). (On demand.) Reberge.

175 LANGUAGE IN POLITICS (3). Examines language as a political issue in the nineteenth and twentieth centuries. Emphasis placed on American and British politics but attention to other national contexts as well. (On demand.) Hendrick.

183 HISTORY AND PHILOSOPHY OF LINGUISTICS (3). Linguistic theories from classical times to the present with special emphasis on the origins of contemporary theories. Fall. Tsipareva.

184 LANGUAGE AND CULTURE (See Anthropology 184) (3).

Courses for Graduates

204 COMPARATIVE GRAMMAR OF GREEK AND LATIN (3). Designed not only for the student of classics but also as a basic course for students of comparative Indo-European grammar. (Alternate years.) Weiss.
205 STRUCTURE AND HISTORY OF MODERN GREEK (Greek 205) (3).
An introduction to the structure of modern Demotic Greek and its place in Greek
linguistic history since Attic-Ionic. Tiapera.

206 THE STRUCTURE OF ARABIC (Arabic 230) (3). Tiapera.

212 ADVANCED PROBLEMS IN PHILOSOPHY OF LANGUAGE
(Philosophy 212) (3).

215 ADVANCED METHODS IN PHONOLOGY (3). Prerequisite, Linguistics
126. Methods of theoretical argumentation in generative phonology with emphasis
on recent proposals in the published literature. Fall. Gerfen.

216 ADVANCED METHODS IN SYNTAX (3). Prerequisite, Linguistics 135 or
consent of the instructor. Examination of recent developments in the theory and

220 ADVANCED SOCIOLINGUISTICS (3). Prerequisite, Linguistics 170 or
consent of the instructor. Current issues in sociolinguistic research with emphasis
on their implications for linguistic theory.

223 SEMINAR IN ANTHROPOLOGICAL LINGUISTICS
(Anthropology 223) (3).

230 COMPARATIVE GRAMMAR OF ANCIENT LANGUAGES (3).
Introductory and advanced work in the earlier stages of extinct languages, such as
Avestan and Sanskrit, and in extinct languages. Spring. Melchert.

238 HISTORY OF THE ENGLISH LANGUAGE
(English 238) (3). Prerequisite, English 237 or permission of the instructor.

250 DIALECTOLOGY (Anthropology 290) (3). Principles and methods of areal
linguistics and social dialectology. (On demand.) Tiapera.

283 CURRENT PROBLEMS IN LINGUISTICS (3). This course explores rela-
tions of linguistics with neighboring fields and theoretical problems of current rele-
ance within linguistics itself; some attention given to pedagogical methodology.
Fall and spring. Staff.

293 LINGUISTIC FIELD WORK (Anthropology 293) (3). Analysis and descrip-
tion of a language unknown to the class from data solicited from a native inform-
ant. Alternate years. Gerfen.

294 LINGUISTIC FIELD WORK II (Anthropology 294) (3).

297 SPECIAL READINGS (3). Readings in linguistic topics that are not covered
in the existing courses. Fall and spring. Staff.

310 LINGUISTICS AND PHILOSOPHY (Philosophy 310) (3).

360 SEMINAR (3). Topics vary to include specialized areas of linguistics study. Fall
and spring. Tiapera.

361 SEMINAR (3). Seminar in phonological theory. Gerfen.

362 SEMINAR (3). Seminar in grammatical theory. Spring.

393 MASTER’S THESIS (3 or more). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

Sanskrit

111 ELEMENTARY SANSKRIT (3). Grammar and readings from the epic and
didactic literature. Fall. (On demand.) Melchert.

112 ELEMENTARY SANSKRIT (3). Continuation of 111. Spring. (On demand.)
Melchert.

201 ADVANCED SANSKRIT (3). Extensive reading from the Dharmacartra, the
Sutras, Brahmanas, and the Vedas. (On demand.) Staff.

202 ADVANCED SANSKRIT (3). Continuation of 201. (On demand.) Staff.

For Irish and Welsh see under English; for Hebrew see under Religious
Studies; for Arabic and for Chinese and Japanese see under Asian Studies in
the Undergraduate Record.

DEPARTMENT OF MARINE SCIENCES

FRANCISCO E. WERNER, Chair

Professors
John M. Bane Jr. (27) Physical Oceanography, Gulf Stream Dynamics, Ocean-
Atmosphere Interactions
Larry K. Benninger (41) Sedimentary Geochemistry
Timothy J. Bralower (30) Micropaleontology, Marine Stratigraphy
Joseph G. Carter (34) Marine Paleoclimatology, Molluscan Systematics
Jan J. Kohlmeyer (22) Marine Botany, Fungi
Richard A. Luedtke (48) Coastal Water Dynamics and Quality
Christopher S. Martens (10) Marine Geochemistry
A. Conrad Neumann (12) Geological Oceanography
Hans W. Pael (39) Microbial Ecology
Charles H. Peterson (31) Ecology, Population Interactions
Frederic K. Pfander (13) Microbiology
John T. Wells (47) Marine Geology, Coastal Geomorphology
Francisco E. Werner (6) Physical Oceanography, Coupled Physical and Biological
Processes

Associate Professors
Marc J. Alperin (51) Chemical Oceanography, Biogeochemistry
Carol Arnott (46) Marine Organic Geochemistry
Nils Lindquist (53) Chemical Oceanology, Natural Products
Andreas Tsekis Microbial Systematics and Evolution; Microbial Ecology;
Microbiology of Hydrothermal Vents and the Marine Subsurface

Assistant Professors
Peter Marko, Molecular Biology. Marine Ecology. Evolution
Rachel Noble, Dynamics of Marine Microbial Food Webs
Alberto Scotti, Computational and Theoretical Fluid Dynamics, Statistical
Mechanics, Mathematical Physics
Harvey E. Seim, Observational Physical Oceanography, Coastal and Estuarine
Dynamics

Research Assistant Professors
Amy Moran, Ecology of Marine Organisms
Thomas J. Stay (50) Gulf Stream Dynamics, Air-Sea Interaction, Turbulence

Adjunct Appointments
Frederick M. Bingham (UNC-Wilmington, Physics) Circulation and Water Mass
Transportation
Mark E. Hay (Georgia Tech) Marine Ecology
William M. Kier (Biology) Functional Morphology of Invertebrates, Biomechanics
Joseph Pawlik (UNC-Wilmington, Biology) Marine Ecology
Martin H. Posey (UNC-Wilmington, Biology) Population Dynamics of Marine
Organisms
John J. W. Rogers (Geology) Geochemistry, Crustal Evolution
Stephen A. Skrabal (UNC-Wilmington, Chemistry) Trace Metal Geochemistry in
Natural Waters
Mark D. Sobsey (Environmental Sciences) Environmental Health Microbiology
Robert H. Stavin (UNC-Greensboro, Biology) Ocean Optical Properties
Joan D. Willey (UNC-Wilmington, Chemistry) Chemical Composition of
Rainwater, Silica Geochemistry

The UNC-Chapel Hill graduate program in Marine Sciences provides
teaching and research in estuarine, coastal, and oceanographic sciences, leading
to M.S. and Ph.D. degrees in Marine Sciences. The two elements of the
program are the Department of Marine Sciences (MASC) located in Venable Hall on the Chapel Hill campus and the Institute of Marine Sciences (IMS) located on the waterfront in Morehead City. The Department of Marine Sciences is the degree granting unit; all Marine Sciences graduate students are enrolled in the department. Most IMS faculty have joint faculty appointments in the department, which enables their participation in graduate student academic activities. Research programs in physical oceanography, marine biology and ecology, marine geochemistry, geological oceanography, and coastal meteorology are conducted in North Carolina and throughout the world by faculty from the department and from the IMS.

Courses and facilities at other coastal laboratories are also available to marine sciences students through cooperative agreements. Courses at North Carolina State University at Raleigh and at Duke University may be taken for credit through an interinstitutional program. Oceanographic experience is available through the Duke/UNC Oceanographic Consortium on the 135-foot research vessel Cape Hatteras, as well as on other ships operated by other oceanographic institutions through the University National Oceanographic Laboratory System.

Each graduate student in the Department of Marine Sciences must gain a broad background in the marine sciences as well as a deep understanding of his or her own subdiscipline. This is accomplished by taking core courses in Geological Oceanography, Biological Oceanography, Chemical Oceanography, and Physical Oceanography (MASC 103, 104, 105, and 106, respectively) and advanced courses determined by each student's advisory committee, as well as participating in research that ultimately results in an M.S. thesis or a Ph.D. dissertation. By the end of the 24-month period that begins when the student first enrolls in the department, the student is expected to have completed the core courses, to have taken most or all of the advanced courses required by the student's committee, to have presented an interdisciplinary seminar (MASC 206), and to take a written comprehensive exam in his or her subdiscipline. Further information may be found on the web at www.marine.unc.edu.

**Requirements for Admission**

For admission to the Department of Marine Sciences, an undergraduate degree is required in a basic science such as physics, mathematics, chemistry, biology, bacteriology, botany, zoology, geology, or in computer science or engineering. Students are advised to develop a broad undergraduate science major with as many as possible of the following courses:

- Mathematics through calculus, computer science, physics, general chemistry, analytical chemistry, organic chemistry, physical chemistry, invertebrate zoology or paleontology, botany, zoology, ecology, physiology, geology, and statistics.

**Degree Requirements**

**Doctor of Philosophy.** The academic program for a Ph.D. student is supervised by a faculty advisory committee of five drawn from the graduate faculty. Requirements for the Ph.D. degree are determined by the student's advisory committee. Course requirements normally include the four core courses listed below, additional advanced courses determined by the student's advisory committee, and one hour of Seminar in Oceanography. A waiver for one or more of the core courses can be arranged with approval of the student's advisory committee and the Department of Marine Sciences Performance Committee for a student who has taken a comparable course, or courses, at another institution. Additional requirements include: presentation of a satisfactory research seminar, passing a comprehensive examination consisting of a written exam and an oral exam; scientific research resulting in a written dissertation, which is defended by the student; a period of study or research at a marine station or on an oceanographic cruise; and teaching experience sufficient to develop and demonstrate competence.

Requirements for comprehensive examinations, admission to candidacy, residence, the dissertation, and final oral examination are provided in the regulations of the Graduate School and in the Department of Marine Sciences Graduate Student Handbook (available on the web at www.marine.unc.edu).

**Master of Science.** The M.S. degree program is similar to the Ph.D. program except for the following: the advisory committee will be composed of three faculty members; the comprehensive examination is a written exam only; and scientific research will result in a written thesis, to be defended by the student. Requirements for the comprehensive examination, admission to candidacy, residence, thesis, and final oral examination are provided in the regulations of the Graduate School and in the Department of Marine Sciences Graduate Student Handbook (available on the web at www.marine.unc.edu).

**Marine Sciences Core Courses**

103 GEOLOGICAL OCEANOGRAPHY (GEOL 188) (4). Prerequisite, GEOL 11 or 41, or permission. Subjects covered include ocean basin origin, continental margin development, coastal geology, carbonate platforms, and pelagic sediments; paleo-oceanographic reconstructions are emphasized. Three lecture and two laboratory hours a week. Spring, Neumann, Bralower.

104 BIOLOGICAL OCEANOGRAPHY (BIOL 140, ENVR 120) (4). Prerequisite, BIOL 54 or 105 or permission. Physical, chemical, and biological factors characterizing estuarine and marine environments with emphasis on factors controlling animal and plant populations, including experimental approaches and methods of analysis, sampling, and identification. Spring, Lindquist.

105 CHEMICAL OCEANOGRAPHY (ENVR 118, GEOL 105) (4). Prerequisite, one semester of physical chemistry or Environmental Sciences 122 or Chemistry 180, or permission of the instructor. Variation and abundance of sea water constituents, the chemical, physical, and biological processes contributing to their distribution as well as problems of dispersion of conservative and nonconservative substances. Three lecture and two recitation hours a week. Fall, Alperin, Arnosti, Martens.

106 PHYSICAL OCEANOGRAPHY (GEOL 106) (4). Prerequisites, MATH 31, 32, PHYS 24, 25 or permission. Descriptive regional oceanography; equations of motion, the Ekman layer, wind-driven currents, thermohaline circulation, modern observations, waves, tides. Four lecture hours a week. Fall, Bane, Seim.

**Other Marine Sciences Courses**

12 THE MARINE ENVIRONMENT (GEOL 12) (3). Introduction to natural science emphasizing physical, chemical, biological, and geological phenomena in oceanic and coastal environments. Human use of, and impact on, marine resources. (Science majors see Marine Sciences 101.) Fall and spring. Staff.

54 INTRODUCTION TO OCEANOGRAPHIC PROCESSES (4). Prerequisite, MATH 31 and either PHYS 24 or CHEM 11. Introduction to the marine environment: ocean basins, sedimentation patterns and processes; sea level changes; oceanic circulation, waves and tides, geochemistry, oceanic chemical cycles, ocean and nearshore ecology. Consideration given to human interaction with and impact on the world's marine systems. Fall. Staff.

101 OCEANOGRAPHY (BIOL 126, ENVR 127, GEOL 101) (3). Prerequisites, major in a natural science or at least two college-level courses in natural sciences. The origin of ocean basins, chemistry and dynamics of seawater, biological communities and processes, the sedimentary record, and the history of oceanography. Term paper. Intended for students with college science background; other students should see Geology 12. Three lecture hours a week. Fall, spring. Staff.
110 GLOBAL CHANGE (3). Prerequisites, two college level courses in natural sciences or permission of instructor. Investigates how man’s activities have perturbed the global environment. Topics: acid rain, ozone depletion, global climate change, causes of environmental change, impact of continuing anthropogenic activity, and the costs and benefits of various mitigation measures. Fall. Alperin, Marrs.

111 EARTH PROCESSES IN ENVIRONMENTAL SYSTEMS (ENST 101, GEOL 111) (4). Prerequisites, MATH 31, CHEM 21, PHYS 25 or PHYS 27, or permission of instructor. Principles of geological and related earth systems sciences are applied to the analysis of environmental phenomena. The link between the lithosphere and other environmental compartments is explored through case studies of environmental issues. Three lecture hours and one lab hour a week. Fall. Bennenger, Band.

112 OCEANIC PROCESSES IN ENVIRONMENTAL SYSTEMS (ENST 102, GEOL 112) (4). Prerequisites, MATH 31, BIOL 11, CHEM 21, PHYS 25 or PHYS 27, MASC 54, or permission of instructor. Principles of analysis of the ocean, coast and estuarine environments, and the processes which control these environments, are applied to the analysis of environmental phenomena. The link between the hydrosphere and other environmental compartments is explored through case studies of environmental issues. Three lecture and one lab hour a week. Spring. Shay.

116 ENVIRONMENTAL SYSTEMS MODELING (ENST 106, ENVR 160, GEOL 110) (3). Prerequisites, MATH 83, PHYS 25 or PHYS 27 (may be taken concurrently), or permission of instructor. Methods for developing explanatory and predictive models of environmental processes are explored. Includes discussion of the relevant scientific models of analysis, mathematical methods, computational issues, and visualization techniques. Two lecture hours and one computer lab hour a week. Spring. Staff. Rial, Scotti, Werner.

119 MARINE BIOGEOCHEMISTRY (ENVR 115) (3). Prerequisites, one year biology plus organic and/or physical chemistry or one of: MASC 101, GEOL 164, ENVR 122. In all other cases, permission of the instructor is required. Integrated application of biological and chemical concepts to understand the processes controlling the cycling of carbon, nutrients, and bioactive trace elements in seawater and marine sediments. Intended for science majors who have completed at least one year of biology plus organic and/or physical chemistry. (Note: Advanced graduate students should consider MASC 140.) Fall. Alternate years. Arnosti.

123 MARINE CARBONATE ENVIRONMENTS (GEOL 123) (4). Prerequisite, permission of the instructor. Chemical and biological origins of calcium carbonate, skeletal structure and chemosystematics, breakdown, preservation, sedimentation, and early diagenesis are studied in a variety of deep and shallow environmental settings, in order to understand skeletal genesis, limestone origin, and carbonate facies variability. Field trip to Florida, Bahamas, or Bermuda. Lab exercises: research report. Three lecture and three laboratory hours a week. Spring. (Alternate years.) Neumann, Credshaw.

125 COASTAL SEDIMENTARY ENVIRONMENTS (GEOL 125) (3). Prerequisite, Geology 57. An introduction to modern shallow-water clastic environments and their sediments, emphasizing barrier islands, deltas, estuaries, wetlands, and tidal flats. Includes local field trips and discussion application of data-collecting techniques. Spring. (Alternate years.) Wells, Marrs.

129 GEOLOGICAL AND OCEANOGRAPHER APPLICATIONS OF GEOGRAPHICAL INFORMATION SYSTEMS (GEOL 119) (4). Prerequisites, four natural science courses or permission of instructor. Focus on applying GIS concepts and techniques to mining and petroleum geology, resource assessment, hydrogeology, coastal and marine geology, physical oceanography, engineering geology, and a geologic perspective on land use.

133 MICROPALEONTOLOGY (GEOL 133) (4). Prerequisite, Invertebrate Paleontology 132, or Marine Ecology 146, or permission of the instructor. An in-depth study of the biostratigraphy, paleoecology, and taxonomy of various microfossil groups (i.e., Foraminifera, ostracodes, conodonts, coccoliths, Radiolaria, diatoms, actinarchs, dinoflagellates, etc.) depending on individual student objectives. Three lecture and three laboratory hours a week. (On demand.) Bradorow.

136 COASTAL PROCESSES (4). An interdisciplinary description and analysis of environmental processes that form and maintain coastal habitats. Coastal aspects of geology, fluid dynamics, chemistry, and biology are considered. Two lectures per week and two coastal field trips. Fall. Staff.

137 ECOLOGY OF WETLANDS (ENVR 114) (4). Prerequisites, one year of biology, one year of chemistry, one semester of ecology, and permission of the instructor. An introduction to the functioning of freshwater and estuarine marsh and swamp ecosystems, with emphasis on systems of the southeastern United States. Fall. Staff.

138 BARRIER ISLAND ECOSYSTEM AND GEOLOGY (6). Prerequisite, courses in general ecology and geology or permission of instructor. An integration of barrier island plant and animal ecology within the context of physical processes and geomorphological change. Emphasis on management and impact of human interference with natural processes. Summer. Peterson, Wells.

140 BIOGEOCHEMICAL CYCLING (GEOL 140) (3). Prerequisite, MASC (GEOL) 145 or 146 or GEOL 164, or ENVR 133, or MASC 105, or permission from the instructor. Biogeochemical cycling explores interfaces between marine, aquatic, atmospheric, and geological sciences emphasizing processes controlling chemical distributions in sediments, fresh and salt water, the atmosphere, and fluxes between these reservoirs. Spring. Marrs, Arnosti.

141 SPECIAL PROBLEMS IN MARINE BIOLOGY (BIOL 141) (4). Prerequisites, BIOL 140 and permission of the instructor. Survey of current problems and intellectual approaches in any of the following areas: Marine Ecology (Bruno, Marko, Peterson); Marine Chemical Ecology (Lindquist); Marine Microbes (Kohlmeyer, Paerl). Hours and credits by prior agreement (with five or more laboratory and conference hours a week per unit credit). Fall, spring, first or second summer sessions (offered on demand at Morehead City, North Carolina).

143 BIOGEOCHEMICAL TECHNIQUES (2). Pre- or corequisite, MASC 105. Introduction to fundamental techniques used in biogeochemical research including sampling, instrumental, and wet chemical analytical measurements, use of stable isotopes and rate measurements using radioactive tracers. Spring. Albert.

144 ORGANIC GEOCHEMISTRY (GEOL 144) (3). Prerequisites, MASC 105 or CHEM 61, or permission of the instructor. Sources, transformations, and fate of natural organic matter in marine environments. Emphasis on interplay of chemical, biological, and physical processes that affect organic matter composition, distribution, and turnover. Fall. (Alternate years.) Arnosti.

145 GEOCHEMISTRY (GEOL 145) (3). Prerequisites, GEOL 11 or 41, CHEM 21, or permission of the instructor. Introduction to the application of chemical principles to geological problems, with emphasis on isotopic methods. Spring. Bennenger.

146 MARINE ECOLOGY (BIOL 146) (3). Prerequisite, BIOL 54 or 105. A survey of ecological and oceanographic processes structuring marine communities in a broad range of habitats with an emphasis on experimental approaches to addressing both basic and applied problems in marine systems. Three lecture hours a week. Spring. (Alternate years.) Peterson, Bone, Marko.

148 MARINE BIOLOGY (BIOL 148) (3). A survey of plants and animals that live in the sea: characteristics of marine habitats, organisms, and the ecosystems will be emphasized. Marine environment, the organisms involved, and the ecological systems that sustain them. Fall. Bruno, Marko, Moran.

151 FLUID DYNAMICS (ENVR 152, GEOL 181, PHYS 151) (3). Prerequisite, PHYS 103 or permission. The physical properties of fluids, kinematics, governing equations, viscous incompressible flow, vorticity dynamics, boundary layers, irrotational incompressible flow. Three lecture hours a week. Fall. Scotti.
152 MARINE SYSTEMS MODELING (ENVR 154, GEOL 141) (1-3). Prerequisite, MATH 32 or permission of the instructor. Mathematical modeling of the dynamic system, linear and nonlinear. The fundamental budget equation. Case studies in modeling convective process, biogeochemical process, population dynamics. Analytical and numerical techniques, chaos theory, fractal geometry. Three lecture hours per week. Spring. Rait, Scotti, Werner.


155 TURBULENT BOUNDARY LAYERS (2). Prerequisite, MASC 106 or 151, or permission from instructor. Turbulence and transport in near-bottom boundary regions. Turbulence and mixing theory in boundary layers. Field deployment and recovery of turbulence measuring instruments. Data analysis from turbulence measurements. Summer. Luetich.

156 DESCRIPTIVE PHYSICAL OCEANOGRAPHY (GEOL 143) (3). Prerequisite, MASC 106 or permission from instructor. Observed structure of the large-scale and mesoscale oceanic circulation and its variability, based on modern observations. In situ and remote sensing techniques, hydrographic structure, circulation patterns, ocean-atmosphere interactions. Three lecture hours a week. Spring. (Alternate years.) Bane, Seim.

197 SPECIAL TOPICS IN COASTAL STUDIES (Var.) Prerequisite, science background or permission. Analysis of coastal zone environments and the processes that control them. Topic selection reflecting faculty specialization, emphasis on field study. Lecture and laboratory hours by arrangement. Fall, spring, summer. Staff.

198 SPECIAL TOPICS IN PHYSICAL OCEANOGRAPHY (Var.) Topics in physical oceanography not covered in regularly scheduled courses. Fall, spring, or summer.

199 SPECIAL TOPICS IN MARINE SCIENCES (2-4) Prerequisites, science background and permission of the instructor. Directed readings, laboratory and/or field study of marine science topics not covered in regularly scheduled courses. Lecture and laboratory hours by arrangement. Fall, spring, or summer. Staff.

206 SEMINAR IN OCEANOGRAPHY (1) Discussion of theories and contemporary research in ocean systems. Topics stress interactions between physical, chemical, biological, and geological processes in the sea. For graduate students in Marine Sciences. Students who enroll must present an interdisciplinary seminar. Fall and spring. Staff.

215 MARINE MYCOLOGY (Biology 215) (6) Prerequisite, BIOL 115. Structure, development, systematics, and ecology of marine fungi. Seven and one-half lecture and fifteen laboratory or field hours a week, given on demand at the Institute of Marine Sciences, Morehead City, Kohlmeier.

221 NUMERICAL ODE/PDE I (MATH 221, ENVR 261) (3). Single, multistep methods for ODEs: stability regions, the root condition; stiff systems, backward difference formulas; two-point BVPs; stability theory; finite difference methods for linear advection diffusion equations. Fall. Minion.

222 NUMERICAL ODE/PDE II (MATH 222, ENVR 262) (3). Elliptic equation methods (finite differences, elements, integral equations); hyperbolic conservation law methods (Lax-Friedrich, characteristics, entropy condition, shock tracking/capturing); spectral, pseudo-spectral methods; particle methods, fast summation, fast multiple/spectral methods. Spring. Minion.

228 MATHEMATICAL MODELING I (MATH 228, ENVR 263) (3). Nonlinearization and identification of leading order physical effects with respect to relevant scales and phenomena; deviation of classical models of fluid mechanics (lubrication, slender filaments, thin film, Stokes flow), deviation of weakly nonlinear envelope equations. Fall. Camassa.

229 MATHEMATICAL MODELING II (MATH 229, ENVR 264) (3). Current models in science and technology: topics ranging from material science applications (e.g. flow of polymers and LCs), geophysical applications (e.g., ocean circulation, quasi-geostrophic models, atmospheric vortices). Spring. Camassa.

250 MODELING DIAGENETIC PROCESSES (3) Prerequisite, MASC 152 or permission of the instructor. An introduction to the theory and application of modeling diagenetic chemical processes in sediments. Diagenetic theory, numerical techniques, and examples of recently developed sediment models. Three lecture hours a week. Spring. (Alternate years.) Agerin.

251 GEOPHYSICAL FLUID DYNAMICS (3) Prerequisite, MASC 151, MATH 128, or permission from instructor. Momentum equations in a rotating reference frame, vorticity, potential vorticity, circulation, the shallow water model, Rossby and Kelvin waves, the Ekman layer. Three lecture hours a week. Spring. (Alternate years.) Bane, Seim, Scotti.

252 OCEAN CIRCULATION THEORY (3) Prerequisite, MASC 106, MASC 151, MATH 129, or permission from instructor. Theories, models of large-scale dynamics of ocean circulation. Potential vorticity, quasi-geostrophy, instabilities. Fall. (Alternate years.) Bane, Seim, Scotti, Werner.

253 COASTAL CIRCULATION (3) Prerequisite, MASC 106, MASC 151, MATH 129, or permission from instructor. Dynamics of the coastal ocean. Shallow water equations, boundary layer and long wave theory, wind driven circulation, tides, estuaries. Fall. (Alternate years.) Werner, Luetich, Seim.

254 OCEAN CIRCULATION MODELING (3) Prerequisite, MASC 106, MATH 129, or permission from instructor. Computational methods used in modeling oceanic circulation. Numerical solution of equations governing mass, momentum, and energy equations. Spring. (Alternate years.) Werner.


256 SEMINAR IN PHYSICAL OCEANOGRAPHY (2) Prerequisite, MASC 106. Discussion of selected literature in the field of physical oceanography. Spring. Staff.

300 RESEARCH IN MARINE SCIENCES (2 or more).

393 MASTER'S THESIS (3 or more).

394 DOCTORAL DISSERTATION (3 or more).

Courses in other departments that are considered appropriate for a graduate major in marine sciences:
Biology 54 Ecology and Population Biology Staff. 
Biology 105 Invertebrate Zoology. Lohman. 
Biology 110 Invertebrate Paleontology. Carter. 
Biology 120 Comparative Physiology. Kier. 
Biology 120L Comparative Physiology Laboratory. Kier. 
Biology 150 Animal Societies and Communication. Wiley. 
Biology 154 Neuroethology. Lohmann. 
Biology 155 Comparative Biomechanics. Kier. 
Biology 186 Community and Systems Ecology. Riepe. 
Biology 186L Community and Systems Ecology Laboratory. Riepe. 
Biology 213 Advanced Marine Ecology. Staff of the Institute of Marine Science. 
Chemistry 140 Modern Methods of Instrumental Analysis for the Health and Environmental Sciences. Analytical Chemistry faculty.
Environmental Sciences 122 Chemical Equilibrium in Natural Waters. Johnson, Singer.
Environmental Sciences 123 Organic Materials in Natural Waters. Christman.
Environmental Sciences 124 Environmental Analytical Chemistry. Charles.
Environmental Sciences 123 Limnology and Water Pollution. Staff.
Environmental Sciences 133 Sources, Transport, and Fate of Environmentally Important Materials. Staff.
Environmental Sciences 134 Environmental Microbiology. Pfender.
Environmental Sciences 233 Microbial Ecology. Pfender.
Geology 146 Physical Geochemistry. Benninger.
Geology 150 History of the Earth. Rogers, Braulover.
Geology 151 Geodynamics. Rogers.
Geology 164 Geochemistry of Natural Waters. Benninger.
Geology 228 Micropaleontology. Braulover.
Geology 227 Paleomagnetism. Braulover.
Geology 228 Sedimentary Petrology. Tettori.
Math 123 Functions of a Complex Variable with Applications. Cima.
Math 124 Elementary and Differential Equations. Hawkins, Petersen, Murphy.
Math 128 Mathematical Models for the Physical Sciences I.
Math 129 Mathematical Models for the Physical Sciences II. Kerzman.
Physics 103 Mechanics I. Hernandez.
Physics 105 Heat and Thermodynamics. Wu.
Statistics 101 Statistical Methods I. Chakravartii, Marron.
Statistics 102 Statistical Methods II. Chakravartii.

DEPARTMENT OF MATHEMATICS
WARREN R. WOGEN, Chair

Professors
Idris Assani (45) Dynamical Systems, Ergodic Theory of Operators
Thomas H. Brylawski (2) Combinatorics
Roberto A. Camassa (36) Mathematical Modeling, Nonlinear Waves, Propagation, Dynamical Systems
Ivan V. Cherednik (48) Representation Theory, Mathematical Physics, Algebraic Combinatorics
Joseph A. Cima (4) Complex Analysis, Functional Analysis
James N. Damon (14) Singularity Theory, Differential Topology
Patrick B. Eberlein (6) Differential Geometry
M. Gregory Forest (7) Nonlinear Waves, Solitons, Fiber Flows of Complex Liquids
Ladnor D. Geissinger (9) Combinatorics, Group Characters
Sue E. Goodman (3) Topology, Dynamical Systems
Jane M. Hawkins (158) Ergodic Theory, Dynamical Systems
Norbert Kerzman (32) Several Complex Variables, Partial Differential Equations
Shawon Kumar (46) Representation Theory, Geometry of Flag Varieties
Karl E. Petersen (20) Ergodic Theory
John A. Pfaltzgraf (22) Complex Analysis
Joseph F. Plante (23) Foliations, Dynamical Systems
Robert A. Proctor (43) Combinatorics, Representation Theory
William W. Smith (25) Commutative Algebra
James D. Stasheff (19) Algebraic Topology, Mathematical Physics
Michael E. Taylor (40) Partial Differential Equations, Harmonic Analysis, Operator Theory
Jon W. Tolle (27) Optimization Theory
Alexandru N. Varchenko (47) Geometry, Mathematical Physics
Jonathan M. Wahl (28) Algebraic Geometry
Mark Williams (36) Partial Differential Equations
Warren R. Wogen (29) Operator Theory

Associate Professors
Kenneth McLaughlin (54) Integrable Systems, Random Matrix Theory, Approximation Theory
Richard McLaughlin (50) Fluid Dynamics and Turbulent Transport
Michael E. Minion (11) Scientific Computation, Computational Fluid Dynamics, Adaptive Mesh Refinement

Assistant Professors
David Adalsteinsson (1) Applied Mathematics and Scientific Computation
David Cai (4) Dispersive Waves, Statistical Physics, Neuroscience
Jingfang Huang (41) Integral Equation Methods and Fast Algorithms
Lev Rozovsky (52) Three-Dimensional Topology

Professors Emeriti
Robert L. Davis
William H. Graves
Robert G. Heyneman
W. Robert Mann
Ansel C. Mewborn
Michael Schlessinger
Johanna Sonner
Fred B. Wright

The Department of Mathematics offers graduate training leading to the degrees of Master of Arts, Master of Science, and Doctor of Philosophy. A master's degree may be included or bypassed in the doctoral program. All of a student's graduate work may be done within the department or, when appropriate, may be done under the direction of an approved advisor in an allied discipline. The M.A.T. degree is also available with a major in mathematics in the School of Education.

The Department of Mathematics is housed in Phillips Hall, as are the Computation Center and the special library for the departments of Mathematics, Physics and Astronomy, Computer Science, and Statistics. This departmental library contains an unusually large and complete collection of mathematical books and journals.

The Department of Mathematics offers a number of teaching assistantships and teaching fellowships each year. Applications for financial aid are also considered for several University fellowships awarded by the Graduate School in the university-wide competition. Applications for admission and financial assistance may be obtained from the dean of the Graduate School. Applications for financial aid should be filed by December 31.

Degree Requirements

The general regulations of the Graduate School govern the work for graduate degrees in mathematics. Specific requirements are explained below. In general, a graduate student in mathematics may receive credit only for mathematics courses numbered 180 and above.

These descriptions summarize the requirements for the master's and Ph.D. degrees. More detailed statements may be obtained from the department. The director of graduate studies must approve all aspects of a student's program. The purpose of the graduate programs is to develop mathematical skills appropriate for competition in academia or industry.

The course schedule for all first year students will depend upon each student's undergraduate training. The normal course load for a graduate student is three courses (nine credit hours) per semester. Graduate students must keep full time status in order to qualify for tuition and health insurance benefits. First year students typically choose courses from five year-long sequences in algebra (186, 187), analysis (193, 196), geometry-topology (180, 181), scientific computation (191, 192) and methods of applied mathematics (198, 199). The Ph.D. comprehensive exams are based on the
content of the first year sequences, and they are offered in January and August each year just before the semester begins.

During the second year a typical Ph.D. student will take the Ph.D. comprehensive exams and select courses from a list of sixteen more advanced "second tier" courses. A typical master's student will complete that degree during the second year. The department considers two years to be the normal time needed to complete a master's degree.

A candidate for a master's degree must satisfy each of the following requirements:

1) Earn at least two semesters of residency credit and complete all requirements within five years.
2) Demonstrate computer programming ability by passing an approved undergraduate or graduate course in programming or by passing an exam administered by the Mathematics Department.
3) Perform satisfactorily in thirty hours of graduate work in a program approved by the director of graduate studies. At least fifteen of these hours must be in Mathematics Department courses numbered 180 or above.
4) Complete a master's project for a Master of Science degree or a master's thesis for a Master of Arts degree.
5) Pass an oral examination upon completion of the master's project or master's thesis. The exam will cover course work as well as the project or thesis.
6) For graduate students entering UNC-Chapel Hill in the fall 2001 semester or later, a master's candidate must pass one of the written comprehensive exams given to doctoral students.

A candidate for a Ph.D. degree must satisfy each of the following requirements:

1) Earn at least four semesters of residency credit and complete all requirements within eight years.
2) Satisfy the same computer programming requirement as a master's student.
3) Demonstrate reading competence in two approved foreign languages by passing an approved course or by passing a translation exam administered by the Mathematics Department.
4) Pass three Ph.D. comprehensive exams by the beginning of the sixth semester.
5) Pass at least six courses from the following two lists; a) the second tier courses or b) first year comprehensive courses not required for the three comprehensive exams the student has passed. Of these six courses at least three must be number 200 or drawn from the second tier list.
6) Pass a preliminary oral exam on the chosen Ph.D. specialty area.
7) Write a Ph.D. thesis and defend it successfully during a final oral exam chaired by the thesis advisor.

The student/faculty ratio of about 3/2 makes it possible for graduate students to take reading courses from individual faculty members that are tailored to meet the student's needs.

Minor in Mathematics

Graduate students in other departments who plan to offer mathematics as a (complete or partial) minor field for the Ph.D. should consult the director of graduate studies in mathematics for approval of their programs and for assignment of an advisor in the Department of Mathematics. This should be done at the earliest possible time, in order to prevent disappointment for the student.

Courses for Graduates and Advanced Undergraduates

101 MATHEMATICAL CONCEPTS IN ART (3). Prerequisite, Art 37. Mathematical theories of proportion, perspective (projective invariants and the mathematics of visual perception). Symmetry and aesthetics are expounded and illustrated by examples from painting, architecture, and sculpture. (Alternate years) Blyowski.

106 MATHEMATICAL METHODS IN BIOSTATISTICS (Biosciences 106) (3). Prerequisite, Mathematics 32 or equivalent. Special mathematical techniques in the theory and methods of biostatistics as related to the life sciences and public health. Includes brief review of calculus, selected topics from intermediate calculus, and introductory matrix theory for applications in biostatistics. Fall.

111 DEVELOPING MATHEMATICAL CONCEPTS (3). Prerequisite, consent of the instructor. An investigation of various ways elementary concepts in mathematics can be developed. Applications of the mathematics developed are considered. This course is ordinarily offered as an in-service course for teachers. Spring.

115 HISTORY OF MATHEMATICS (3). Prerequisite, calculus and abstract algebra; graduate students by permission only. A brief general survey of the history of mathematics. Some special problems in depth. Problems in the history of mathematics. Spring.


118 BASIC CONCEPTS OF ANALYSIS (3). Prerequisite, Mathematics 32 and consent of the instructor. Limits, continuity, differentiability, uniform continuity, Riemann integration. Infinite sequences and series; uniform convergence; power series. A student cannot receive credit for this course after receiving credit for Mathematics 193. Summer.

121 ADVANCED CALCULUS I (3). Prerequisites, Mathematics 33 and Mathematics 81. The real numbers: continuity and differentiability of functions of one variable; infinite series; integration. Fall and spring.

122 ADVANCED CALCULUS II (3). Prerequisite, Mathematics 121. Functions of several variables: derivative as linear transformation; inverse and implicit function theorems; multiple integration. Spring.

123 FUNCTIONS OF A COMPLEX VARIABLE WITH APPLICATIONS (3). Prerequisite, Mathematics 83. The algebra of complex numbers, elementary functions and their mapping properties, complex limits, power series, analytic functions, contour integrals, Cauchy's theorem and formulae. Laurent series and residue calculus, elementary conformal mapping and boundary value problems. Poisson integral formula for the disk and the half plane. Spring.

124 ELEMENTARY DIFFERENTIAL EQUATIONS (3). Prerequisite, Mathematics 83. Linear differential systems, power series solutions, Laplace transforms, numerical methods. Fall and spring.

125 COMPUTER-ASSISTED MATHEMATICAL PROBLEM SOLVING (3). Prerequisite, Mathematics 83. Personal computer as tool in solving a variety of mathematical problems, e.g., finding roots of equations and approximate solutions of differential equations. Introduction to appropriate programming language. Emphasis on graphics. Fall.

126 INTRODUCTION TO PROBABILITY (Statistics 126) (3). Prerequisite, Mathematics 33. An introduction to the mathematical theory of probability, covering random variables; moments; binomial, Poisson, normal, and related distributions; generating functions; sums and sequences of random variables; combinatorial and statistical applications. Fall and spring.

128 MATHEMATICAL METHODS FOR THE PHYSICAL SCIENCES I (3). Prerequisites, Mathematics 83 and Physics 24-25, or equivalent. Theory and applications of Fourier series and transform, Laplace transform, Sturm-Liouville problems. Students are expected to do some numerical calculations with a programmable calculator or a computer. Fall.

129 MATHEMATICAL METHODS FOR THE PHYSICAL SCIENCES II (3). Prerequisites, Physics 24-25, and one of Mathematics 121, 124, or 128 or equivalent. Introduction to boundary value problems for the diffusion, Laplace, and wave partial differential equations. Bessel functions and Legendre functions. Introduction to complex variables including the calculus of residues. Spring.
130 TOPOLOGY (3). Prerequisite, Mathematics 33; corequisite, Mathematics 83
or permission of the instructor. Introduction to topics in topology, particularly
surface topology, including classification of compact surfaces, Euler characteristic, ori-
entability, vector fields on surfaces, tessellations and fundamental group. Research
problems discussed at elementary level. Spring.

131 EUCLIDEAN AND NON-EUCLIDEAN GEOMETRIES (3). Prerequisite,
Mathematics 81 or permission of the instructor. Critical study of basic notions and
models of Euclidean and non-Euclidean geometries, order, congruence and distance.
Summer and spring.

133 ELEMENTARY THEORY OF NUMBERS (3). Prerequisites, Mathematics 32
and 81. Divisibility, Euclidean algorithm, congruences, residue classes, Euler’s func-
tion, primitive roots, Chinese remainder theorem, quadratic residues, number theo-
retic functions. Fairy and continued fractions, Gaussian integers. Fall and spring.

134 ELEMENTS OF MODERN ALGEBRA (3). Prerequisite, Mathematics 81.
Sets and functions, rings, ordered integral domains, integers, fields and rational
numbers, real and complex numbers, polynomials, groups. Fall and spring.

137 LINEAR ALGEBRA (3). Prerequisites, Mathematics 81 and Mathematics 83.
Vector spaces, linear transformations, duality, diagonalization, primary and cyclic
decomposition, Jordan canonical form, inner product spaces, orthogonal reduction of
symmetric matrices, spectral theorem, bilinear forms, multilinear functions. Fall and spring.

138 ALGEBRAIC STRUCTURES (3). Prerequisite, Mathematics 137 or 147.
Permutation groups, matrix groups, groups of linear transformations, symmetry
groups, finite abelian groups; residue class rings, algebra of matrices, linear maps,
and polynomials: real and complex numbers, rational functions, quadratic fields,
finitely fields. Fall.

147 LINEAR ALGEBRA FOR APPLICATIONS (3). Prerequisite, Mathematics 33.
Algebra of matrices with applications; determinants; solutions of linear systems by
Gaussian elimination; Gram-Schmidt procedure; eigenvalues. Math 116 may not be
taken for credit after credit has been granted for Math 147. Fall, spring, and summer.

148 COMBINATORIAL MATHEMATICS (Statistics 156) (3). Prerequisite,
Mathematics 81 or permission of the instructor. Recurrence relations and generat-
ing functions; graph and graph algorithms, principle of inclusion-exclusion. Fall.

151 DETERMINISTIC MODELS IN OPERATIONS RESEARCH (Statistics
181, ORSA 181) (3). Prerequisite, Mathematics 147. Linear, integer, non-linear,
and dynamic programming; classical optimization problems; network theory. Fall and spring.

155 INTRODUCTION TO DYNAMICS (3). Topics will vary and may include
iteration of maps, orbits, periodic points, attractors, symbolic dynamics, bifurca-
tions, fractal sets, chaotic systems, systems arising from different equations, iterated
function systems and applications.

157 TOPOICS IN MATRIX THEORY (3). Prerequisites, Mathematics 137 or 147
or equivalent, and some computer programming language. Quadratic and hermitian
series; applications to systems of differential equations; nonnegative matrices. Perron-
Frobenius Theorem; integer matrices, some applications in combinatorics. Spring.

161 ACTUARIAL MATHEMATICS I (3). Prerequisite, Mathematics 33. An
introduction to the basic mathematical models of actuarial science. Deterministic
and simple stochastic models of compound interest and life contingency theory are
studied. Fall.

162 ACTUARIAL MATHEMATICS II (Statistics 136) (3). Prerequisites,
Mathematics 161 and Statistics 126. The theory introduced in Actuarial
Mathematics I is expanded to encompass more complicated models of financial
transactions and risks. Spring.

166 INTRODUCTION TO NUMERICAL ANALYSIS (3). Prerequisites,
Mathematics 83 and some knowledge of computer programming, iterative meth-
ods, interpolation, polynomial and spline approximations, numerical differentiation
and integration, numerical solution of ordinary and partial differential equations.
The subject matter of this course includes the material covered in the Society of
Actuaries examination on numerical methods. Fall.

175 TOPICS IN ANALYSIS (3). Prerequisite, Mathematics 122 or consent of
the instructor. Topics may include linear spaces, convexity, mathematical programming,
duality, algorithms, and other subjects related to the mathematical theory of opti-
imization. Fall.

176 TOPICS IN ALGEBRA (3). Prerequisite, consent of the instructor. Topics
may include number theory, algebraic number theory, field theory, and algebraic
geometry.

177 TOPICS IN GEOMETRY (3). Prerequisite, consent of the instructor. Topics
may include non-Euclidean geometries, linear geometry, finite geometries, topology,
and algebraic geometry.

180 GEOMETRY OF CURVES AND SURFACES (3). Prerequisite, advanced
calculus. Topics include: curves, Frenet formulas, isoperimetric inequality, theorems
of Crofton, Poncelet, Fary-Milnor; surfaces) fundamental forms. Gaussian and
mean curvature, special surfaces, geodesics, Gauss-Bonnet theorem. Fall.

181 INTRODUCTORY TOPOLOGY (3). Prerequisites, Mathematics 193 and
186 or permission of the instructor. Topological spaces, connectedness, separation
axioms, product spaces, extension theorems. Classification of surfaces, fundamental
group and covering spaces. Spring.

186 MODULES, LINEAR ALGEBRA, AND GROUPS (3). Prerequisite,
Mathematics 138 or permission of the instructor. Modules over rings, canonical
forms for linear operators and bilinear forms, multilinear algebra, group and group
actions. Fall.

187 GROUPS, REPRESENTATIONS, AND FIELDS (3). Prerequisite,
Mathematics 186. Internal structure of groups, Sylow theorems, generators and rela-
tions, group representations, fields, Galois theory, category theory. Spring.

189 ENUMERATIVE COMBINATORICS (3). Prerequisite, Mathematics 138 or
permission of the instructor. Basic counting, partitions, recurrences and generating
functions, signed enumeration, counting with respect to symmetry, plane partitions
and tableaux.

190 COMBINATORIAL STRUCTURES (3). Prerequisite, Mathematics 138 or
permission of the instructor. Graph theory, matchings, Ramsey theory, extremal set
theory, network flows, lattices, Mobius inversion, q-analogs, combinatorial and pro-
jective geometries, codes and designs.

191 SCIENTIFIC COMPUTATION (3). Error in computation. Solution of non-
Numerical integration and differentiation. Introduction to numerical solution of
ODEs. Introduction to numerical linear algebra. Fall.

192 SCIENTIFIC COMPUTATION II (3). Direct methods for linear systems.
Least squares problems. Iterative methods for linear systems. Direct and iterative
methods for eigenvalue problems. The singular value decomposition. Methods for
(stiff) systems of ODEs. Spring.

193 INTRODUCTORY ANALYSIS (3). Prerequisite, advanced calculus.
Elementary metric space topology; continuous functions; differentiation of vector-
valued functions; implicit, inverse function theorems; series of functions. Measure
theory, convergence theorems, L1 spaces. Fall.

195 PROBABILITY (Statistics 155) (3). Prerequisite, Statistics 154 or permission
of the instructor. Foundations of probability theory. Basic classical theorems. Modes
of probabilistic convergence. Central limit problem. Generating functions, charac-
teristic functions. Introduction to stochastic processes. Spring.

196 COMPLEX ANALYSIS (3). Prerequisite, Mathematics 193. A rigorous treat-
ment of complex integration, including the Cauchy theory. Elementary special
functions, power series, local behavior of analytic functions. Maximum modulus
197 QUALITATIVE THEORY OF DIFFERENTIAL EQUATIONS (3). Prerequisites, linear algebra and Math 193, or consent of the instructor. Existence and uniqueness theorems, linear and nonlinear systems, differential equations in the plane and on surfaces, Poincare-Bendixson Theory. Liapunov stability and structural stability, critical point analysis. Spring.

198 METHODS OF APPLIED MATHEMATICS I (3). Topics: Contour integration in the complex plane, asymptotic expansions and steepest descent/stationary phase methods, special functions often arising in physical applications, elliptic functions and theta functions, Sturm-Liouville spectral theory. Fall.

199 METHODS OF APPLIED MATHEMATICS II (3). Topics: Perturbation methods for ODE and PDE, WKB method, averaging, modulation theory for linear dispersive PDEs and nonlinear wave equations; long-time asymptotics of Fourier integral representations of PDEs; Green's functions; physical applications. Spring.

201 INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS (3). Prerequisite, Mathematics 193. Basic methods in partial differential equations. Topics may include: Cauchy-Kowalewski Theorem, Holmgren's Uniqueness Theorem, Laplace's equation, Maximum Principle, Dirichlet problem, harmonic functions, wave equation, heat equation.

203 MEASURE AND INTEGRATION (3). Prerequisite, Mathematics 193 or consent of the instructor. Lebesgue and abstract measure and integration, convergence theorems, differentiation, Radon-Nikodym theorem, product measures, Fubini theorem, Lebesgue spaces, invariance under transformations. Haar measure and convolution. Fall.

204 INTRODUCTORY FUNCTIONAL ANALYSIS (3). Prerequisite, Mathematics 203. Hahn-Banach and separation theorems. Hamel basis; normed and locally convex spaces, duals of spaces and maps, weak topologies; closed graph and open mapping theorems, uniform boundedness theorems. Spring.

205 ADVANCED COMPLEX ANALYSIS (3). Prerequisite, Mathematics 196. Laurent series; Morera-Lebesgue and Weierstrass theorems; Riemann mapping theorem; Runge's theorem; additional topics chosen from: harmonic, elliptic, univalent, entire, meromorphic functions; Dirichlet problem; Riemann surfaces. Fall.

206 SEVERAL COMPLEX VARIABLES (3). Prerequisite, Mathematics 196. Elementary theory; the Cousin problems, domains of holomorphy, Range domains and polynomial approximation, local theory, complex analytic structures, coherent analytic sheaves and Stein manifolds, Cartan's theorems. Spring. (Alternate years.)

210 TOPICS IN ANALYSIS (3). Prerequisite, consent of the instructor. Subjects may include geometric function theory, Riemann surfaces, Nevanlinna theory, Banach spaces of analytic functions, calculus of variations, distribution theory, partial differential equations, or Fourier Series. Spring.

213 ADVANCED FUNCTIONAL ANALYSIS (3). Prerequisite, consent of the instructor. Subjects may include operator theory on Hilbert space, operators on Banach spaces, locally convex spaces, vector measures, Banach algebras. Spring. (Alternate years.)

215 TOPICS IN COMPUTATIONAL MATHEMATICS (3). Prerequisites, Mathematics 191, 192. Topics may include: finite element method; numerical methods for hyperbolic conservation laws, infinite dimensional optimization problems, variational inequalities, inverse problems. Spring.

221 NUMERICAL ODE/PDE, I (Environmental Sciences and Engineering 285. Marine Sciences 221) (3). Prerequisites, Mathematics 191, 192. Single, multistep methods for ODEs: stability regions, the root condition; stiff systems, backward difference formulas; two-point BVPs; stability theory; finite difference methods for linear advection diffusion equations. Fall.

222 NUMERICAL ODE/PDE, II (Environmental Sciences and Engineering 287, Marine Sciences 222) (3). Prerequisite, Mathematics 221. Elliptic equation methods (finite differences, elements, integral equations); hyperbolic conservation law methods (Lax-Friedrich, characteristics, entropy condition, shock tracking/capturing); spectral, pseudo-spectral methods; particle methods, fast summation, fast multipole/vortex methods. Spring.

224 HARMONIC ANALYSIS (3). Prerequisite, consent of the instructor. Subjects may include topological groups, abstract harmonic analysis. Fourier analysis, non-commutative harmonic analysis and group representation, automorphic forms, and analytic number theory. Fall. (Alternate years.)

228 MATHEMATICAL MODELING I (Environmental Sciences and Engineering 288, Marine Sciences 228) (3). Prerequisites, Mathematics 198, 199, 191, 192. Nondimensionalization and identification of leading order physical effects with respect to relevant scales and phenomena; derivation of classical models of fluid mechanics (lubrication, slender filament, thin films, Stokes flow); derivation of weakly nonlinear envelope equations. Fall.

229 MATHEMATICAL MODELING II (Environmental Sciences and Engineering 289, Marine Sciences 229) (3). Prerequisites, Mathematics 198, 199, 191, 192. Current models in science and technology: topics ranging from material science applications (e.g., flow of polymers and LCPs); geophysical applications (e.g., ocean circulation, quasi-geostrophic models, atmospheric vortices). Spring.


234 TOPICS IN ALGEBRA (3). Prerequisite, Mathematics 230. Topics from the theory of rings, theory of bialgebras, homological algebra, algebraic number theory, categories and functions.

253 TOPICS IN COMBINATORIAL MATHEMATICS (3). Prerequisite, Mathematics 190 or consent of the instructor. Topics may include: combinatorial geometries, coloring and the critical problem, the bracket algebra, reduced incidence algebras and generating functions, binomial enumeration, designs, valuation module of a lattice, lattice theory. Spring. (Alternate years.)

257 ALGEBRAIC GEOMETRY (3). Prerequisite, Mathematics 231. Topics may include: algebraic varieties, algebraic functions, abelian varieties, projective and complete varieties, algebraic groups, schemes and the Grothendieck theory, Riemann-Roch theorem. Spring. (Alternate years.)

261 THEORY OF DYNAMICAL SYSTEMS (3). Prerequisite, consent of the instructor. Topics may include: ergodic theory, topological dynamics, stability theory of differential equations, classical dynamical systems, differentiable dynamics.


272 DIFFERENTIAL GEOMETRY (3). Prerequisite, Mathematics 271. Riemannian geometry, first and second variation of arc and applications, effect of curvature on homology and homotopy, Chern-Weil theory of characteristic classes, recent applications due to Bott, Chern-Simons, and Baum-Connes. Spring.


274 LIE ALGEBRAS (3). Prerequisite, Mathematics 186. Nilpotent, solvable, and semisimple Lie algebras, structure theorems, root systems, Weyl groups, weights, classification of semisimple Lie algebras and their finite dimensional representations, character formulas. Fall.
277 SPECIAL TOPICS IN GEOMETRY (3 each). Prerequisite, Mathematics 271. Topics may include elliptic operators, complex manifolds, exterior differential systems, homogeneous spaces, integral geometry, submanifolds of Euclidean space. Fall. (Alternate years.)

286 ALGEBRAIC TOPOLOGY (3). Prerequisites, Mathematics 181 and 186. Homotopy and homology; simplicial complexes and singular homology; other topics may include cohomology, universal coefficient theorems, higher homotopy groups, fibre spaces. Spring.

287 TOPICS IN ALGEBRAIC TOPOLOGY (3). Prerequisite, Mathematics 286 or permission of the instructor. Topics primarily from algebraic or differential topology, such as cohomology operations and the Steenrod algebra, homotopy groups, fibre bundles, spectral sequences, Postnikov systems, K-theory, cobordism, Morse Theory, surgery, topology of singularities. Fall and spring. (Alternate years.)

390 SEMINAR AND DIRECTED READINGS (1-3).

392 MASTER'S PROJECT (3 or more).

393 MASTER'S THESIS (3 or more). (This should not be taken by students electing nonthesis master's projects.)

394 DOCTORAL DISSERTATION (3 or more).

DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

JEFFREY A. FREILINGER, Chair

Professors
Steven L. Buchenheimer (30) Molecular Biology of Viruses
Janie G. Cannon (43) Genetics of Pathogens, Pathogenesis of Infectious Disease
Stephen H. Clarke (53) Molecular Immunology, Structure and Function of Immunoglobulin Genes
Myron S. Cohen (55) Biology and Epidemiology of Transmission of STD Pathogens, Including HIV
Jeff Dangl, Plant Genetics and Cellular Biology, Plant Disease Resistance and Cell Death Control
Marshall H. Edgell (7) Generic Engineering, Molecular Biology
Susan A. Ficcus (65) HIV Pathogenesis and Diagnostics
James D. Folds (9) Immunology of Treponema Pallidum Infection, Clinical Immunology
Jeffrey A. Freilinger (47) Immunogenetics, Cellular Immunology, Immune response to Viruses
Peter H. Gilligan (51) Bacterial Toxins, Clinical Microbiology
Jack Griffith (35) Chromosome Structure: Viruses and Their Host Cells
Norin M. Hadler (60) Mechanism and Control of Chronic Inflammatory Response
Eng-Shiang Huang (48) Molecular Biology, and Pathogenesis of Human Cytomegalovirus
Clyde A. Hutchison III (12) Molecular Genetics, Genetic Engineering
Robert E. Johnston (62) Molecular Genetics of Viral Pathogenesis, Recombinant Viral Vaccines
Shannon Kenney, Epstein-Barr Virus Gene Regulation and Gene Therapy, Approaches for Epstein-Barr Virus Associated Tumors
David G. Klapper (35) Immunoregulation, Immunogenetics, Structure of Proteins of Immunologic Interest
David C. Lee (54) Extracellular Growth Factors: Oncogenes
Steven R. Mestnick, Malaria and Pneumocystis, Molecular Epidemiology, Pathogenesis, Drug Resistance
John E. Newbold (13) Molecular Virology
Joseph S. Pagano (14) Epstein-Barr Virus Latency, Antiviral Drugs, Interferon Regulatory Factors
Nancy Raab-Traub (52) Molecular Virology and Oncogenesis
Howard M. Reiner (51) Immunogenetics of Human Plasma Proteins, Particularly IgG and Coagulant Factors VII and IX
P. Frederick Sparling (18) Bacterial Pathogenesis, Molecular Biology of Bacterial Membranes
Ronald Swanstrom (74) Molecular Biology and Pathogenesis of HIV
Jenny P. Ting (50) Molecular Immunology, Transcription, Signal Transduction, Apoptosis, Neuroimmunology, Transplantation
William J. Yount (25) Genetic Control of Antibody Response and Gamma Globulin Synthesis in Humans

Associate Professors
Ralph Baric, Molecular Mechanisms of Virus Cross Species Transmissibility and Pathogenesis
Robert Bourret (64) Signal Transduction in Bacteria, Chemotaxis
Patrick M. Flood (60) T-cell Activation, Regulatory T-cells, Response to HIV Infections
Jean Handy (37) Cellular Mechanisms of Oxygen Toxicity, Role of Iron in Microbial Virulence and Host Defense
Andrew H. Kaplan (72) Human Immunodeficiency Virus, Infectious Diseases
Thomas Kawula (63) Bacterial Genetics, Microbial Pathogenesis
Glenn Matsushita (68) Molecular Neuroimmunology
Jonathan Serody, Transplantation and Tumor Immunology
Diane C. Skugars, HIV Pathogenesis
Lihan Su (71) Immune Development, Viral Pathogenesis

Assistant Professors
Edward Collins (69) Structural Immunology, Immunotherapeutics
Miriam Braunstein, Bacterial Pathogenesis, Molecular Genetics, Tuberculosis
Blossom Damania, Kaposi's Sarcoma-Associated Herpesvirus (KSHV/FHV-8), Rhesus Monkey Rhadinovirus (RRV)
Aravinda de Silva (73) Arthropod Vector-Borne Infectious Diseases and Microbial Pathogenesis
Tal Kafri, Development of HIV-Based Vectors for Gene Therapy
Roland Tisch (70) Immune Tolerance, T-cell Antigen Recognition, T-cell Mediated Autoimmunity, Tumor Antigen-specific Genetic Vaccines
Barbara J. Vilen, Molecular Immunology, Signal Transduction
Jennifer Webster-Cyriaque, Oral Manifestations of Systemic Disease, Host-Virus Interactions, Viral Oncogenesis, Viral Pathogenesis During Immunosuppression, Signal Transduction, Cellular Biology, and Gene Expression

Research Associate Professors
Larry Arnold, Flow Cytometry, Immunogenetics
Nancy L. Davis (66) Molecular Genetics of Viral Pathogenesis, Recombinant Viral Vaccines
Christopher Elkins, Bacterial Pathogenesis, Iron Acquisition
Marcia M. Hobbs, Gonococcal Pathogenesis, STD Pathogen Research and Molecular Diagnostics
Nancy Van Houten, Mucosal Immunology, Lymphocyte Biology

Research Assistant Professors
Mark Heise, Molecular Genetics of Viral Pathogenesis
Karen McKinon, Dendritic Cell Induction of Tumor Specific CD4 and CD8 T Lymphocytes
Ruth Silversmith, Bacterial Chemotaxis

Professors Emeriti
Kenneth F. Bott
William J. Cromartie
Harry Gooder
G. Philip Manire
John H. Schwab
Myron S. Silverman
William R. Stroyno
Robert Twarog

* joint faculty members
The Department of Microbiology and Immunology, an administrative division of the School of Medicine, is a unit of the Graduate School. It offers instruction leading to the Doctor of Philosophy degree. A terminal Master of Science degree is granted only under special conditions. Research in the department, supported by funds from the University, National Institutes of Health, National Science Foundation, American Cancer Society, private foundations, and other granting agencies, focuses on a wide variety of molecularly oriented projects. Areas of investigation include the nature of bacteria and viruses, host-parasite interactions, pathogenic mechanisms, molecular genetics, various areas of immunology, and eukaryotic cell and molecular biology.

Facilities

The department occupies three floors in the Mary Ellen Jones Building, and has spacious research laboratories supplemented by several darkrooms, facilities for tissue culture, oligonucleotide and peptide synthesis, animal care, computer analysis, and P3 physical containment for hazardous recombinant DNA research. All the routine apparatus and instrumentation required for the most sophisticated modern microbiology research is available.

Individual faculty members are provided with well-equipped laboratories for their own work and that of postdoctoral fellows, graduate students, technicians, and other personnel. In addition, several campus-wide facilities provide services such as DNA and protein sequencing, tissue culture, and flow cytometry, among others. There is a highly interactive collaboration with faculty in the Lineberger Comprehensive Cancer Center.

Financial Assistance

At present the stipend is $18,000 per year plus tuition, fees, and health insurance. Funds are available from the department, the university, and individual research grants; students are strongly encouraged to apply for a Predoctoral Fellowship from the Howard Hughes Medical Institute and the National Science Foundation.

Admission Requirements

Although the department has no specific course requirements for admission, applicants with strong undergraduate training in biological sciences, biochemistry, chemistry and/or physics are viewed most favorably.

Significant research experience (undergraduate research or relevant work experience) is an important asset. Admission is competitive and limited to an entering class of approximately ten students each year. Along with the Graduate School general application, applicants must submit official transcripts of all post-secondary education, official Graduate Record Examination (GRE) scores, a minimum of three letters of recommendation, and a statement of purpose describing previous research experience and career goals. A personal interview is generally required and occurs only at the invitation of the Admissions Committee. International students must include a financial certificate and official TOEFL scores. Applicants are encouraged to take the advanced biology section of the GRE, however, knowledge of advanced biology is not necessarily reflective of a person's microbiology or immunology background.

The department recommends that all application materials be submitted and received by January 15; however, completed applications will be reviewed as early as December. Applicants are therefore strongly encouraged to send in their completed applications as early as possible. Applicants are only admitted into the fall semester.

Curriculum

The graduate program is strongly research oriented. Students admitted to the department generally do three laboratory rotation projects during the first year in the process of selecting a research mentor. First-year students generally take two didactic (lecture) courses each semester, in addition to the laboratory rotations. Most students take MICRO 108 and 109 or MICRO 117 and 118 in the first year, plus an elective didactic course each semester.

In all, students are required to take at least six courses in addition to MICRO 201, 202, and 301; at least two of the courses must be seminar tutorials. Specific courses taken by each student may vary, depending on his/her interests and background. There is no language requirement. Graduate courses in the departments of Anatomy and Cell Biology, Chemistry, Biochemistry, Pathology, and other departments are available for those students seeking special preparation in these areas. Special arrangements can be made with uniquely qualified medical students wishing to pursue a specific M.D./Ph.D. program.

The preliminary examination and oral examination scheduled at the end of the second year stress written and oral command of selected scientific disciplines rather than a broad comprehensive test of the field. During subsequent years, students focus on the execution of an independent research project, under the guidance of a faculty advisor. Students are usually required to serve as laboratory assistants for one semester each during their second and third year. Most students complete the work for the Ph.D. in five to six years.

Courses for Graduates and Advanced Undergraduates

108 ADVANCED MOLECULAR BIOLOGY I (Genetics 110, Biochemistry 110, Pharmacology 136, Biology 178) (3). DNA structure, function, and interactions in prokaryotic and eukaryotic systems, including chromosome structure, replication, recombination, repair, and genome fluidity. Three lecture hours. Fall. Griffith, staff.

109 ADVANCED MOLECULAR BIOLOGY II (Biochemistry 111, Genetics 111, Pharmacology 137, Biology 179) (3). Prerequisites, at least one undergraduate course in both biochemistry and genetics and permission of the instructor. RNA structure, function, and processing in biological systems including: transcription, gene regulation, translation, protein, and RNA transport. Spring. Fried, staff.

112 INTRODUCTION TO MICROBIOLOGY (3). Open only to dental students. A course covering basic aspects of microbiology including sterilization, disinfection, action of antimicrobial chemotherapeutic agents, concepts of infection and immunity and the study of certain selected infectious agents. Forty-three lecture hours and twelve laboratory hours. Spring. Gooder, staff.

114 IMMUNOBIOLOGY (3). Prerequisites. A strong background in molecular biology, eukaryotic genetics, and biochemistry and permission of instructor. Topics include immunology; genetic mechanisms, and development of cells and cell interactions; hypersensitivity, autoimmunity, resistance to infection. Three lecture hours. Fall. Klapper, staff.

115 SPECIAL TOPICS IN MICROBIOLOGY OR IMMUNOLOGY (3 or more each semester). Permission of the department required except for departmental majors. Designed to introduce the student to research methods. Laboratory research projects are conducted with advice and guidance of the staff. May be repeated for credit two or more semesters. Hours and credit to be arranged, any term. Staff.

117 CELL STRUCTURE, FUNCTION AND GROWTH CONTROL I (Cell Biology 117, Biochemistry 117, Pharmacology 117) (Var.). Prerequisites: undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function, and transformation. Fall. Jacobson, Lee, Meissner, Pariye.
118 CELL STRUCTURE, FUNCTION AND GROWTH CONTROL II (Cell Biology 118, Biochemistry 118, Pharmacology 118) (Var.). Prerequisites: undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function, and transformation. Spring. Jacobson, Lee, Meisner, Paris.

130 VIROLOGY (Var.). Current concepts of the chemistry, structure, replication, genetics, and natural history of animal viruses and their host cells. Staff.

135 BACTERIOLOGY (Var.). Selected aspects of bacterial cell structure, physiology, genetics, genomics, gene expression, signal transduction, and growth outside the laboratory environment. Bourret.

140 MICROBIAL PATHOGENESIS (4). Prerequisites: Microbiology 130 and 135, or permission of instructor. Comprehensive course encompassing the molecular and biological basis of bacterial and viral pathogenesis, including the role of the host response in controlling the infectious disease process. Spring. Kawula, staff.

189 MOLECULAR BIOLOGY TECHNIQUES (Genetics 189, Biochemistry 189, Biology 189, Physiology 189, Pharmacology 189) (4). Prerequisites: some molecular biology permission of the instructor. This one or two week intensive course is part of the Carolina Workshop series. Topics emphasized vary but usually include techniques such as isolation of nucleic acids, blotting, cloning in viruses and plasmids, and DNA sequencing. Fall, spring, and summer courses available. Litaker and staff. Fee required.

Courses for Graduates

201, 202 SEMINAR IN MICROBIOLOGY (1 each). Seminars on selected topics in microbiology. Fall and spring. Staff.

210 SEMINAR/TUTORIAL IN PROKARYOTIC MOLECULAR BIOLOGY (Var.). One or two faculty and a small number of students will consider current research of importance in depth. Emphasis is on current literature, invited speakers, etc., rather than textbooks. Fall and spring. Staff.

211 SEMINAR/TUTORIAL IN ANIMAL VIROLOGY (Var.). One or two faculty and a small number of students consider current research of importance in depth. Emphasis is on current literature, invited speakers, etc., rather than textbooks. Fall and spring. Staff.

212 SEMINAR/TUTORIAL IN IMMUNOLOGY (Var.). One or two faculty and a small number of students consider current research of importance in depth. Emphasis is on current literature, invited speakers, etc., rather than textbooks. Fall and spring. Staff.

291 DIRECTED READINGS IN VIROLOGY (1). Prerequisite, one prior virology course or permission of instructor. Directed readings in virology under the direction of a member of the graduate faculty. May be repeated for credit.

301 RESEARCH IN BACTERIOLOGY OR IMMUNOLOGY (3 or more each semester). Permission of the department required. Designed to introduce the student to research methods and special techniques. Short-term problems are conducted with advice and guidance of the staff. May be repeated for credit two or more semesters. Hours and credit to be arranged, any term. Staff.

393 MASTER'S THESIS (3 or more each semester). Staff.

394 DOCTORAL DISSERTATION (3 or more each semester). Staff.

DEPARTMENT OF MUSIC

JAMES KETCH, Chair
John R. Covach, Director of Graduate Studies

Professors
Mark Evan Bonds (6) Late Eighteenth- and Nineteenth-Century Music
Tim Carter (3) Late Sixteenth- and Seventeenth-Century Music, Opera Studies, Analysis

Jon W. Finson (6) Nineteenth-Century Music, American Music
John L. Nidas (57) Late Medieval Music, Italian Opera
Severine Neff (12) Twentieth-Century Music and Theory
Thomas A. Warburton (17) Twentieth-Century Music and Theory

Associate Professors
Allen Anderson (4) Theory, Composition
John R. Covach (35) Twentieth-Century Music and Theory, Philosophy of Music, Popular Music
Anne Guatter (7) Nineteenth- and Early Twentieth-Century Music, French Music, Women's and Gender Studies, Cultural Studies
Philip Vandermeer, Traditional and American Popular Music

Assistant Professors
Sean Gallagher (11) Late Medieval and Renaissance Music
Anne MacNeil (8) Sixteenth- and Seventeenth-Century Music, Music and Theater, Gender Studies, Historiography
Jocelyn Neal (5) Twentieth-Century Theory, Popular Music
Sarah Weiss (2) Indonesian and Southeast Asian Performance Traditions, Aesthetics, Gender Studies, Postcolonial Studies

Degrees

The department offers the degrees of Master of Arts (M.A.) in Music History and Literature, and the Doctor of Philosophy (Ph.D.) in Musicology. It also supports the School of Education's programs leading to the degrees of Master of Arts in Teaching (M.A.T.), and Doctor of Education (Ed.D.) with a minor or special project in music; applications to these programs are made to the School of Education, from which information is available. More detailed information on the Music Department's faculty and programs may be found on the department's website: www.unc.edu/depts/music.

Special Facilities

Central to the departmental resources is the Music Library, which ranks high among the nation's music libraries for its scholarly editions, periodicals, early source materials, iconographic aids, microfilms, folk music collections, and recordings. Several extensive private collections assembled by individual faculty members for special studies are available to advanced students.

Prerequisites for Degree Programs

The usual prerequisite for admission to graduate work leading to the M.A. and Ph.D. degrees is a bachelor of arts degree with a major in music, comparable to that given at this university. All applicants for graduate study in music are required to take the departmental diagnostic exam and the verbal and quantitative aptitude tests of the Graduate Record Examination. The GRE should be taken early enough for the scores to be submitted with the application for admission, preferably in the summer or fall preceding application for admission. Applicants for the M.A. or the Ph.D. program must also submit a thesis or research paper with the application.

Language and Course Requirements, Examinations

M.A. candidates must pass the departmental examination in one modern foreign language; Ph.D. candidates, in two. M.A. candidates must pass the departmental theory proficiency and keyboard proficiency examinations. Students entering the Ph.D. program with a completed M.A. from another institution also must pass these theory and keyboard examinations and should complete them as early in their course of study in the department as possible.

Music 110, Analysis of Eighteenth- and Nineteenth-Century Music, Music 111, Analysis of Twentieth-Century Music, and Music 101,
Resources and Methods in Musicology, are required of all M.A. students. Graduate students have the option to include courses from other departments that may be organized as a formal minor (nine hours for the M.A., fifteen for the Ph.D.) or as a supporting program. Such programs are devised and approved through consultation with the student’s adviser and the departments concerned. A formal minor in Medieval Studies is also available from the Department of Classics.

M.A. candidates take courses totaling thirty credit hours and write a thesis that is a revision of a paper prepared for a graduate course. All candidates for a master’s degree take a final oral examination covering course work; a final written examination is not given. At the beginning of each spring semester a qualifying examination is given to those who wish to proceed to the Ph.D. program after finishing the M.A. Students already in the department’s M.A. program take the examination in the second year. Those who received the M.A. at another institution must take the examination in the spring of the first year of study; these students are evaluated during the second semester of study and are advised as to whether they should continue. Following the completion of course work and language requirements, Ph.D. students take a written examination in three areas of specialization to be determined through consultation with the faculty, and an oral examination on a proposed dissertation topic.

Fellowships, Assistantships, and Other Student Aid
In addition to campus-wide grants (discussed elsewhere in this catalog), assistantships and special grants are available to selected graduate students in music. The deadline for all graduate applications is January 1; separate application for aid is not necessary but may be indicated on the general application form for admission to the Graduate School. Selected applicants are nominated for university-wide awards that range from $9,000 to $17,000. Assistantships awarded by the department require about ten hours of service per week. Departmental awards range from $9,000 to $13,000 and may include consideration for partial tuition remission for out-of-state students. Qualified students will be appointed as teaching assistants or research assistants.

Courses for Graduates and Advanced Undergraduates
101 RESOURCES AND METHODS OF MUSICLOGY (3). Introduction to the scope, methodology, and bibliography of musicology. Extensive use of the music library, preparation for advanced seminars, and proper research procedures are stressed. Fall.

110 ANALYSIS OF EIGHTEENTH- AND NINETEENTH-CENTURY MUSIC (3). Analysis of traditional tonal forms, both homophonic and contrapuntal. Study in detail of two to three large works by major composers such as Bach, Beethoven, Mozart, and Wagner. Fall.

111 ANALYSIS OF TWENTIETH-CENTURY MUSIC (3). Analysis of a wide variety of works by composers such as Scriabin, Schoenberg, Stravinsky, Bartók, Ives, Debussy, Britten, Cage, Copland, and Gershwin. Study of two or three large works in detail. Spring.

Courses for Graduates
248 PROSEMINAR IN MUSIC THEORY (3). Topics and staff to be announced. Fall and spring.

249 PROSEMINAR IN MUSICOLGY (3). Topics and staff to be announced. Fall and spring.

250 PROSEMINAR IN ETHNO-MUSICOLGY (3). Topics and staff to be announced. Fall and spring.

298 SPECIAL STUDIES. The faculty assists and advises graduate students in work on particular research projects. Hours and credits to be arranged.

336 SEMINAR IN MUSIC THEORY (3). Topics and staff to be announced. Fall and spring.

337 SEMINAR IN MUSICOLGY (3). Seminar subjects and staff to be announced. Fall and spring.

338 SEMINAR IN ETHNO-MUSICOLGY (3). Seminar subjects and staff to be announced. Fall and spring.

393 MASTER’S THESIS (3 or more). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

CURRICULUM IN NEUROBIOLOGY
GERRY S. OXFORD, Director

Professors
W. E. Bollenbacher (109) Developmental Neuroendocrinology
Thomas W. Boudin (98) Neurotoxicology, Models of Peripheral Neuropathy, Blood-Nerve Barrier
George R. Bresee (2) Cellular and Molecular Neurobiology, Neuropharmacology, Alcoholism, Neuroplasticity, Transcription Factors, RT/PCR Developmental Disorders, Neuropsychiatric Disorders
Fulton T. Crews (133) Molecular Aspects of Neuronal Vitality and Alcohol
Stephen T. Crews (129) Molecular Genetics of Drosophila Nervous System Development, Control of Neural Gene Regulation
Linda Dykstra (51) Behavioral Pharmacology, Opioid Analgesics, Opioid/Immune Interactions
Gregory K. Essick (106) Somatosensory Psychophysics and Neurophysiology
Paul B. Fiald (111) Regulation of Neuron Number, Axon Guidance
Lawrence I. Gilbert (79) Biochemical and Molecular Insect Neuroendocrinology
Robert S. Greenwood (61) Neuropeptide and Neuroendocrine Plasticity and Seizures; Brain Growth and Development in Neuro-Fibromatosis
T. Kendall Haden (59) G-proteins, Phospholipase C, and Receptor-Mediated Regulation of Second Messenger Signaling; P2-purinergic Receptors
Mark Hollins (125) Somatosensory Information Processing; Tactile Perception, Pain
James P. Howard Jr. (93) Electrophysiology of Neuromuscular Disorders, Synaptic Transmission, Immunology of Myasthenia Gravis
Henry S. Hsiiao (18) Sensors and Instrumentation, Computer Interfaces, Human Behavior/Memory, Audience Opinion Research, Telemedicine
Jean M. Lander (71) Neurotransmitters as Developmental Signals, Prenatal Exposure to Drugs of Abuse and Environmental Neurotoxins, Effects on Developing Neurotransmitter Systems
Jeffrey A. Lieberman (141) Neurobiology of Psychotic Disorders, Psychopharmacology, Neuroimaging
Alan R. Light (89) Neurobiology of Descending Pain Modulation Systems
Kathleen C. Light (119) Cardiovascular and Renal Responses to Stressors, Sympathetic and Hormonal Activity, Hormone Replacement Therapy, Cardiac and Vascular Benefits. Beta-Blockade Effects on Cytokine Responses to Stress in Inflammatory Disorders
F. Kay Lund (88) Growth Factors: Molecular Biology, Signal Transduction and Role in Nervous System During Development and Aging
Donald T. Lyle (122) Neuroimmunology, Learning Processes
Richard B. Mailman (82) Biochemical and Molecular Pharmacology of Dopamine Receptors, Molecular Drug Design
William Maixner (112) Pain Mechanisms and Analgesia
Patricia F. Mannes (50) Cell Adhesion and Signal Transduction in Developing Neurons
Paul B. Manis (151) Cellular Basis of Auditory Information Processing in Brainstem and Cortex
Ken D. McCarthy (77) Neuronal-Glia Interactions Studied in Hippocampal Brain


Slices Using Electrophysiology, Confocal Imaging and Conditional Gene Knockout Mice
David L. Mcllwain (13) Chemistry of Regeneration and Degeneration in Spinal
Motorneurons
Gerhard W. Meissner (55) Excitation-Contraction Coupling, Intracellular Calcium
Release Channels
Piero Morell (27) Neurochemistry: Gene Expression Related to Myelin Metabolism,
Mechanisms of Demyelination, Brain Lipid Metabolism: Neurotoxicology
Robert A. Nicholas (147) Signaling and Targeting Pathways of P2Y Nucleotide
Receptors
Gerry S. Oxford (67) Biophysics of Excitable Membranes, Ion Channels and
Neurosecretion
Cort A. Pedersen (91) Neuroendocrinology and Neuropharmacology of Parenting
and Sexual Behavior, Behavioral and Psychological Role of Oxotremorin and
Vasopressin, Psychobiology of Postpartum Depression
H. Benjamin Peng (92) Development of Synapse, Cellular and Developmental
Neurobiology
Edward R. Perl (35) Functional Organization and Synaptic Mechanisms for Pain
and Other Somatic Sensations
Peter Petrusz (36) Neuroendocrinology, Reproductive Biology
Mitchell J. Picker (128) Behavioral Pharmacology of Opioids, Drug Tolerance and
Cross-Tolerance, Sex and Genetic Determinants of Opioid Sensitivity
Brian J. Popko (113) Myelin and Transgenic Mice
Aldo Rustioni (50) Excitatory and Inhibitory Neurotransmitters in Somatosensory
Richard J. Samulski (135) Development of Viral Vectors for Brain Specific Gene
Delivery
Robert Sealsock (58) Cell Biology and Biochemistry of the Neuromuscular Junction,
Dystrophin and Dystrophin-Associated Proteins
Paul G. Shimkoff (41) Neural and Behavioral Plasticity in Sensory Systems,
Cerebellar Mechanisms of Learning and Memory
William D. Snider (148) Developmental Regulation of Neuronal Growth Factors
Ann E. Stuart (70) Mechanics and Control of Hatamine Release and Re-uptake
at Photoreceptor Synapses and Their Effect on Signal Transfer
Kathleen C. Sulik (131) Teratology, Embryology
Kisukio I. Suzuki (96) Neuropathology of Inborn Errors of Metabolism, Gial
Reactions to CNS/PNS Degeneration
Kumihiko Suzuki (95) Molecular Genetics of Lysozomal and Other Neurogenetic
Disorders
Jenny R. Ting (105) Use of Murine Models to Study the Role and Regulation of
Inflammatory Genes in Demyelination and Remyelination
Terray A. Van Dyke (143) Cell Growth Regulation, Cancer, Gene Expression
Barry L. Whitel (46) Somatosensory Mechanisms
R. Mark Wightman (118) Neurotransmitters, Dopamine Reward, Excitotoxicity,
Neurochemistry
R. Haven Wiley (67) Social Organization and Communication in Vertebrates

Associate Professors
James C. Garbutt (134) Neurobiology and Psychopharmacology of Alcoholism
John H. Gilmore (137) Human Brain Development, Immune Regulation of
Neurodevelopment, Schizophrenia
Michael E. Guy (111) Biochemistry and Physiology of Excitable Cells, Synapse
Formation, Second Messenger Mechanisms in Signal Transduction, Epithelial
Biology
Clay W. Hodges (150) Neurobehavioral Pharmacology and Pharmacogenomics of
Addiction
Anthony LaMantia (146) Inductive Signaling and Control of Gene Expression in
the Developing Forebrain/Inductive Control of Genes Related to Neurological
and Psychiatric Diseases
Kenneth J. Lohmann (130) Animal Navigation, Neuroethology of Magnetic
Orientation Behavior, Neural Control of Glia
Glenn K. Matsushita (139) Neuroimmunology: Function of Activated Microglia in
Neurodegenerative Disease
Sharon L. Mignogna (140) Protein Trafficking and Cell Signaling in Polarized Cells,
Role of Scaffolding and Adaptor Proteins in Polarized Cells
A. Leslie Morrow (121) Molecular Neurobiology of GABAA Receptors and
Alcoholism
Robert L. Rosenberg (115) Regulation of Ion Channels
Ellen R. Weiss (144) Regulation of G Protein Signaling Pathways; Visual Signal
Transduction

Assistant Professors
Regina M. Cardillo (142) Behavioral Neurophysiology, Neurobiology of Drug Abuse,
Brain Reward Systems
Richard E. Chenn (130) Molecular Motors in the Nervous System, Cellular and
Molecular Neurobiology of the Cytoskeleton
Sela Mager (145) Molecular Physiology of Neurotransmitter Transports

Research Professor
Rick B. Meeker (107) Neuroendocrine Regulation, Glutamate Receptors,
Mechanisms of AIDS Dementia

The Neurobiology Curriculum of the University of North Carolina at Chapel Hill includes faculty from the departments of Cell Biology and Anatomy, Anesthesiology, Biochemistry and Biophysics, Biostatistics, Chemistry, Medicine, Neurology, Oral Biology, Oral Surgery, Pathology, Pharmacology, Cell and Molecular Physiology, Psychiatry, Psychology, Biology, and from the Curricula in Genetics and in Biomedical Engineering and Mathematics, and the Program in Molecular Biology and Biotechnology. The theme unifying members of these diverse departments is a desire to understand the mechanisms through which the nervous system functions. While sharing this fundamental interest in the nervous system, research techniques used by members of the curriculum are quite diverse and provide the student with the opportunity to master a wide variety of laboratory skills.

Graduate students working toward the Ph.D. in Neurobiology must take Neurobiology 111, 112, 201A or 202, 210, 222 and 223, 290, and 394, as well as other courses suggested by the director.

The minor in neurobiology consists of a minimum of fifteen hours of courses selected from the list below with the approval of the director.

Fellowships, commensurate with usual grants-in-aid, are available to support graduate students who are working toward the Ph.D. degree under the direction of a faculty member in the Neurobiology Curriculum and who major in neurobiology. After the first year, graduate students receive travel awards to attend national scientific meetings.

Applicants are urged to complete their applications by January 1.

Courses for Graduates and Advanced Undergraduates

101c CONDITIONING AND LEARNING (Psychology 101) (3). Prerequisite, Psychology 22. A comprehensive survey of the methods, findings, and theories of classical and operant conditioning. Students develop skills necessary to evaluate, integrate, and summarize significant original literature. Fall, Eckerman.

102b BIOLOGICAL FOUNDATIONS OF BEHAVIOR (Psychology 102) (3). Prerequisite, Psychology 22 or Biology 11. Ethological, genetic, and physiological variables are studied in relation to their behavior effects. Fall, Gatzpey; Spring, Lyle.

106b PHYSIOLOGICAL PSYCHOLOGY (Psychology 106) (3). Prerequisites, Psychology 10, 23, or permission of the instructor. Elements of neurophysiology, neuroanatomy, and neurochemistry as they apply to the understanding of brain-behavior relationships. As announced, Cardelli.

111, 112 NEUROBIOLOGY LABORATORY APPRENTICESHIP (3-9). Prerequisite, permission of the director of Training in the Neurobiology Curriculum. A laboratory-tutorial course to acquaint the student with methods used in several areas of neurobiology. Fall, spring. Faculty of the Neurobiology Curriculum.
125 INTRODUCTION TO NEUROPHYSIOLOGY (Biology 121) (3). Prerequisites, Biology 52 and 50. Survey of neurobiological principles, including development, morphology, physiology, and molecular mechanisms, in vertebrates and invertebrates. Three lecture hours a week. Spring. Bollenbacher.

150 NEUROBIOLOGY (3). Prerequisite, permission of the instructor. A tutorial in selected topics in neurobiology tailored to meet interests of the students and competencies of instructors. Fall and spring. Staff.

Courses for Graduates

201A BEHAVIOR AND ITS BIOLOGICAL BASES I (Psychology 201) (3). A survey of psychological and biological approaches to the study of sensory and perceptual information processing; perceptual development. Fall. Staff.

201C BIOMEDICAL INSTRUMENTATION (Biomedical Engineering 111) (3). Topics include basic electronic circuit design, analysis of medical instrumentation circuits, physiologic transducers (pressure, flow, bioelectric, temperature, and displacement). This course includes a laboratory where the student builds biomedical devices. Spring. Haas, Johnson.

202 BEHAVIOR AND ITS BIOLOGICAL BASES II (Psychology 202) (3). A survey of psychological and biological approaches to the study of basic learning and higher integrative processing. Spring. Staff.

204 ADVANCED BIOLOGICAL PSYCHOLOGY: CENTRAL NERVOUS SYSTEM (Psychology 204) (3). Prerequisite, Psychology 106 or equivalent. Each fall one specific topic is covered in depth, e.g., neural bases of memory storage, homeostasis, and perception. Format includes lecture and seminar meetings with student presentations. Fall. Shinkman.

205 ADVANCED BIOLOGICAL PSYCHOLOGY: AUTONOMIC NERVOUS SYSTEM (Psychology 205) (3). Prerequisites, Psychology 106 and/or 202, or permission of the instructor. Autonomic nervous system bases of emotion, motivation, and learning. Two lecture and two laboratory hours a week, as announced. Staff.

207 APPLICATIONS OF EXPERIMENTAL PSYCHOLOGY TO HEALTH RESEARCH (Psychology 207) (3). This course provides a critical analysis of interdisciplinary research within experimental psychology, including such topics as psychopharmacology, psychoneuroimmunology, psychophysiology, and animal models of brain/behavior disorders. Fall. Carelli, Dykstra, Girdler, Light, Lyle, Ficker.

210 MEDICAL NEUROBIOLOGY (Physiology 210) (3). Prerequisite, permission of the course director. A special seminar of the Neurobiology course for medical students (for neurobiology graduate students only). Structural and functional organization is analyzed at the level of the cell membrane, the neuron, and integrated neuronal systems. Spring. Fare, staff.

211, 212 SPECIAL TOPICS IN PHYSIOLOGY (Physiology 211, 212) (3-5). Prerequisite, permission of the instructor. Individually arranged in-depth programs of selected topics such as membrane function, transport physiology, renal physiology, etc. Fall and spring. Staff.

222A CELLULAR AND MOLECULAR NEUROBIOLOGY: ELECTRICAL SIGNALING (2). Prerequisite, permission of instructor. Considers the genesis of electrical impulses in the nervous system with emphasis on membrane potentials, voltage-gated ion channels, and structural features of neurons that influence coding. Course meets for five weeks with six lecture hours per week. Fall. Stuart.

222B CELLULAR AND MOLECULAR NEUROBIOLOGY: POSTSYNAPTIC MECHANISMS-RECEPTORS (2). Prerequisite, permission of instructor. Consideration of membrane receptor molecules activated by neurotransmitters in the nervous system with emphasis on ligand binding behavior and molecular and functional properties of different classes of receptors. Course meets for four weeks with six lecture hours per week. Fall. Stuart.

222C CELLULAR AND MOLECULAR NEUROBIOLOGY: PRESYNAPTIC MECHANISMS (2). Prerequisite, permission of instructor. The mechanisms regulating the release of neurotransmitters from nerve terminals are explored including quantal release, vesicle and terminal membrane proteins, neurotransmitter transporters, and plasticity of synaptic transmission. Course meets for five weeks with six lecture hours per week. Fall. Stuart.

223A CELLULAR AND MOLECULAR NEUROBIOLOGY: POSTSYNAPTIC MECHANISMS-INTRACELLULAR SIGNALING (2). Prerequisite, permission of the instructor. Explores biochemical signal transduction events following activation of neurotransmitter receptors including G-protein coupling, desensitization, signaling specificity, downstream effectors, calcium signaling and tyrosine kinases. Course meets for five weeks with six lecture hours per week. Spring, Stuart.

223B CELLULAR AND MOLECULAR NEUROBIOLOGY: DEVELOPMENTAL NEUROBIOLOGY (2). Prerequisite, permission of instructor. The molecular and cellular basis for development of neurons and networks. Topics include the basic CNS embryogenesis, molecular basis of neurite extension and pathfinding, specification of cell fate, and synaptogenesis. Course meets for five weeks with six lecture hours per week. Spring. Stuart.

224 PAIN AND SOMATIC SENSATION (Physiology 224) (2). Prerequisite, Physiology 140 or equivalent. Consideration of peripheral and central neural mechanisms for somatic sensation with particular emphasis on pain. Spring. Perl.

225 EXPERIMENTAL NEUROPHYSIOLOGY (Biology 225) (3). Prerequisite, permission of the instructor. Six or more laboratory hours a week. On occasion. Staff of Neurobiology Curriculum.

235 SEMINAR IN CHEMICAL NEUROBIOLOGY (Biochemistry 235) (2). Prerequisite, two semesters of biochemistry. Fall 2001 and alternate years. Morell.

259 SEMINAR IN COMPARATIVE ANIMAL BEHAVIOR (Biology 259) (2). Prerequisite, permission of the instructor. Fall or spring. Lohmann, Willey.

260 SEMINAR IN COMPARATIVE PHYSIOLOGY (Biology 260) (2). Prerequisite, Biology 120 or permission of the instructor. Fall or spring. Staff.

290 SEMINAR IN NEUROBIOLOGY (Physiology 290) (Pharmacology 290) (3). Prerequisite, permission of the director of the Neurobiology Curriculum. An intensive consideration of selected topics and problems in neurobiology. The course focuses on the development of presentation and evaluation skills of the trainees. Six credit hours required for neurobiology graduates. Spring. Faculty of the Neurobiology Curriculum.

302 SEMINAR IN THE BIOLOGICAL FOUNDATIONS OF PSYCHOLOGY (Psychology 302) (3). Prerequisite, permission of the instructor. Limited to graduate students in Psychology and Neurobiology. Lectures and seminar presentations on a wide range of topics in the area of physiological psychology. Fall and spring. Carelli.

310 RESEARCH IN NEUROBIOLOGY (Biochemistry 310) (Pharmacology 310) (Physiology 310) (Biology 302) (3-12). Prerequisite, permission of a staff member. Research in various aspects of neurobiology. Six to twenty-four hours a week. Fall and spring. Faculty of the Neurobiology Curriculum.

323 BEHAVIORAL PHARMACOLOGY (Psychology 323, Pharmacology 323) (3). Prerequisite, Psychology 124 or permission of the instructor. Basic principles of pharmacology and behavior analysis are considered in relation to drugs that affect the central nervous system. Spring. Dykstra.

394 DOCTORAL DISSERTATION (Var.). Fall, spring, summer. Research advised.

SCHOOL OF NURSING

LINDA R. CRONENWETT, Dean
Richard W. Redman, Associate Dean for Academic Affairs
Jennifer D'Auria, Director of Master's Programs
Diane Hoditch-Davis, Director of Doctoral and Post Doctoral Programs
Professors
Linda Bebee (109) Psychiatric-Mental Health Nursing
Linda R. Cronenwett (105) Measurement of Health Care Quality
Jo Ann Dalton (23) Adult Health, Oncology, Pain
Molly C. Dougherty (104) Women's Health; Urinary Continence
Anne H. Fiebich (2) Psychiatric-Mental Health Nursing
Catherine I. Fogel (6) Women's Health Nursing
Sandra G. Funk (32) Research Methodology; Statistics
Jean Goepinger (89) Community Health Nursing; Community-Based Self-Care, Rural Health
Joanne Harrell (54) Adult Health, Promotion of Cardiovascular Health across the Life Span
Diane Holdaugh-Davis (60) Children's Health; Neonatology
Diane Kjervik (103) Aging; Bioethics
Barbara Mark (5) Health Care Systems
Margaret S. Miles (52) Children's Health, Parenting
Marie Mishel (82) Uncertainty in Illness, Instrument Development
Richard W. Redman (3) Health Care Outcomes; Patient Assessments of Care
Margaret Szendelowski (64) Women's Health; Research Methodology

Associate Professors
Barbara J. Bunker (15) Adult Health; Critical Care, Trauma and Burns
Becky Christian (86) Children's Health; Chronic Illness
Jennifer D'Auria (85) Children's Health, Chronic Illness
Virginia T. Davis (29) Children's Health
Barbara Germinno (49) Adult Health; Thanatology, Oncology
Edward Halloran (79) Health Care Systems
Carol Hogue (65) Frail Elderly; Quality of Life in Old Age
Margaret F. Hudson (10) Adult Health; Geriatric Health
Cheryl Jones (112) Health Care Systems
Mary Lynn (84) Health Care Systems; Quality of Care
Shirley Mason (12) Community Health Nursing
Chris McQuiston (100) Primary Care; Community; HIV/STD Prevention
Judith Miller (37) Adult Health; Hospitalized Elderly
Virginia J. Neelon (13) Adult Health; Physiology
Mary Palmer (6) Gerontology; Incontinence
Susan F. Pierce (26) Health Care Systems; Ethics
Pamela Pletsch (7) Women's Health; Community; Prevention
Joyce Rasim (114) Caregivers for Elderly
Anne Skelly (99) Primary Care, Chronic Disease Self-Care
Marcia Van Riper (8) Ethics, Developmental Disabilities

Assistant Professors
Julie Barroso (107) Adult Health
Alice Boyington (108) Community Health Nursing; Urinary Continence; Informatics
Dennis J. Czech (9) Pathophysiology and Pharmacotherapeutics
Janna Diekmann (113) Community Health Nursing, History
Yvonne Eaves (43) Community Health Nursing; Caregiving in Frail Elders
Noreen Esposito (11) Women's Health
Pamela Rowsey (44) Physiology
Suzanne Thoyer (45) Children's Health

Professors Emeriti
Laurel Archer Copp (22)
Margery A. Duffy (42)
Cynthia Freeland (17)
Nancy M. Milo (28)
Marion Woods

Associate Professors Emeriti
Audrey J. Booth
Emaline M. Browning (14)
Margaret E. Campbell (16)
Mary C. Doow (31)
Bonnie K. Henley
Betty H. Landsberger
Patricia A. Lawrence (11)
Helen M. Murphy (25)
Barbara Nerles-Carlson
Barbara C. Ryerson (19)
Marian Smalkegan

Master of Science in Nursing
The Master of Science in Nursing (MSN) Program prepares nurses in specialized areas of advanced nursing practice with role preparation as a nurse practitioner, clinical nurse specialist, and/or health care systems specialist.

Length of Program
The program of study varies from 39 to 40 credits of academic coursework including clinical practice, an oral comprehensive examination, and a research project or in some cases, a thesis. All nurse practitioners, psychiatric/mental health advanced practice, and health care systems students complete 40 credits. Neonatal, pediatric, and women's health care clinical nurse specialist students complete 39 credits. Students may pursue the MSN degree on a full-time or part-time basis.

The Curriculum
The curriculum consists of four components: the professional core, the research core, and the advanced nursing practice specialty courses. The professional core courses (NURS 146, NURS 147) and research core courses (NURS 274, NURS 275, NURS 392 or 393) are required for all MSN students. The clinical core courses and advanced practice area courses focus on the student's selected area of specialization and role preparation.

The specialty areas offered by the program reflect a combination of current practice trends as well as available faculty resources. Content in specialty areas and the types of areas of specialization offered are adjusted based on these factors. In some advanced practice specialty areas, electives in nursing or other disciplines or courses to support a focus area are required. Each student is admitted to a specific advanced practice area and a faculty advisor helps design a program of study that is appropriate to the student's educational and career goals. Dual programs of study may be developed on an individual basis, but involve a longer program of study. Upon completion of the program, students are eligible to sit for national certification examinations appropriate to their advanced nursing area of preparation.

The specialty areas of advanced nursing practice currently offered include: Adult Nurse Practitioner, Health Care Systems, Children's Health (Pediatric Nurse Practitioner, Neonatal Nurse Practitioner, or Neonatal-Pediatric Clinical Nurse Specialist), Family Nurse Practitioner, Psychiatric-Mental Health Advanced Practice Nursing, and Women's Health (Women's Health Care Nurse Practitioner or Clinical Nurse Specialist). A Rural Community-Oriented Primary Care option is available for family nurse practitioner students; option requires an additional 7 credits of course work beyond the 40 required hours in the master's program. An up-to-date listing of the advanced practice areas being offered and detailed descriptions of the curriculum for each specialty area may be accessed through the School of Nursing home page; click on "Degree Programs."

Graduate Courses
NURS 117 HEALTH CARE INFORMATICS (3) Focuses on developing an understanding of the concepts relevant to health care informatics and the use of computer systems and the use of computer applications to support clinical and administrative decision-making.
NURS 142 HEALTH PROMOTION AND ILLNESS PREVENTION IN ADVANCED NURSING (2). Focuses on the promotion of health, prevention of illness, and identification of factors that impact health across the life span.

NURS 146 HEALTH CARE SYSTEMS IN THE U.S.: DEVELOPMENT, IMPACTS, AND IMPLICATIONS FOR NURSES (3). Examines health care systems development, impacts, and prospects for change. Content enables nurses to draw implications for nursing practice and advocacy for improving systems.

NURS 147 APPROACHES TO ADVANCED PRACTICE INTEGRATING THEORIES, ROLES, AND ISSUES (3). Examines the historical evolution, theoretical roots, current roles, and context of advanced practice nursing. Content addresses the definition issues and scope of advanced practice nursing within a changing environment.

NURS 200 DEVELOPMENTAL PHYSIOLOGY (3). Explores developmental changes in morphological processes and normal and abnormal physiology in humans from conception through adolescence. Physiological differences between infants and children and adults are emphasized.

NURS 209 PSYCHIATRIC-MENTAL HEALTH NURSING INTERVENTION FOR GROUPS (1). Prerequisites or corequisites, NURS 224, NURS 246, or consent of instructor. Students analyze and apply theories, techniques, and research relevant to therapy with groups. Clinical placement with selected preceptors provides opportunities for unique experiences.

NURS 210 PRIMARY CARE MANAGEMENT OF ADULTS (3-4). Prerequisites, NURS 226, NURS 230. Focuses on the management of illnesses common to young, middle and older adults in ambulatory care.

NURS 211 CHILD HEALTH ISSUES IN PRIMARY CARE (3). Prerequisites: NURS 142, NURS 226, NURS 229, NURS 230, NURS 210. Examines the principles of assessment, management, evaluation, and continuing care of children in primary care settings. Developmentally appropriate, family-centered approaches and management of common medical problems are addressed.

NURS 212 SEXUAL AND REPRODUCTIVE HEALTH (3). Prerequisites: NURS 142, NURS 226, NURS 229, NURS 230, or permission of instructor. Uses a life span approach to examine principles of primary care management of childbearing couples and sexual reproductive health in women and men. Application is in community-based settings.

NURS 213 SELECTED ISSUES IN ADULT HEALTH (4). Prerequisites: NURS 210 NURS 226, NURS 230. Provides the opportunity for an in-depth examination of management strategies with selected health problems in adults and examines issues inherent in the management of women and elderly populations.

NURS 223 ADVANCED ASSESSMENT AND DIAGNOSTIC REASONING IN NEONATAL AND PEDIATRIC NURSING (4). Prepares the advanced practice neonatal/pediatric nurse to comprehensively assess neonates and children using a diagnostic reasoning process.

NURS 224 ADVANCED DIAGNOSTIC PROCESS IN PSYCHIATRIC-MENTAL HEALTH NURSING (4). Prerequisites, NURS 224 or permission of instructor. Introduces students to the role of the advanced practice psychiatric/mental health nurse. Models for assessment, intervention, and evaluation are explored and tested clinically.

NURS 226 ADVANCED HEALTH ASSESSMENT AND DIAGNOSTIC REASONING IN PRIMARY CARE NURSING (4). Examines the process of diagnostic reasoning as a framework to synthesize comprehensive assessment of adult patients. It focuses on clinical evaluation of common problems that are present in primary care settings.

NURS 229 PHARMACOTHERAPEUTICS IN ADVANCED NURSING PRACTICE (3). Prerequisites, NURS 223 or NURS 224 or NURS 226 or permission of instructor. Examines principles of pharmacotherapeutic decision making in advanced nursing practice with application to clinical management of common health problems specific to all age groups, encompassing a life-span approach.

NURS 230 PATHOPHYSIOLOGY FOR ADVANCED NURSING PRACTICE (3). Examines the physiological and pathophysiological responses to injury-effects on cell function, host defense responses, maintenance of vital functions, and neuroendocrine-immune responses.

NURS 236 LEADERSHIP IN ORGANIZATIONS (3). Examines health care and nursing practice organizations, the influence of the external and internal environment on these organizations, and the role and relationship of nurse leaders to the nursing practice environment and to the greater organization.

NURS 237 HUMAN RESOURCES MANAGEMENT (3). Explores the knowledge and skills required for effective human resource management. Managerial behaviors that promote and maintain a professional nursing practice environment are emphasized.

NURS 238 FINANCIAL MANAGEMENT (3). Examines the issues of health care economics, financial management, and budgeting that relate to managerial decision-making.

NURS 239 OUTCOMES MANAGEMENT (3). Explores theories and methods related to outcomes management for quality improvement in health care, including improvement science, patient safety approaches, health services, research, evidence based practice, and translation research.

NURS 240 NURSING INTERVENTIONS WITH PSYCHOPHYSIOLOGICAL PROBLEMS OF INFANTS AND CHILDREN (2-3). Prerequisites: NURS 223, N242 or permission of instructor. Prepares the advanced practice neonatal or pediatric nurse to design and implement a coordinated system of interventions that promote optimal health and development status for infants and children with psychophysiological health problems.

NURS 241 FAMILY RESPONSES TO INFANT, CHILD, AND ADOLESCENT HEALTH PROBLEMS (2-3). Prerequisites: NURS 223, N242 or permission of instructor. Focuses on family responses to neonatal and pediatric health problems. Students function in an advanced practice nursing role, working with families of neonatal and pediatric clients with acute and chronic health problems.

NURS 242 ADVANCED CONCEPTS IN AMBULATORY PEDIATRIC NURSING (4). Prerequisites: NURS 223, concurrent NURS 229. Focuses on ambulatory nursing management of children. Content includes health promotion, health maintenance, and common clinical symptomatology/problems in infants, children, and adolescents.

NURS 243 NURSING MANAGEMENT RESIDENCY AND INTEGRATIVE SEMINAR (3). Students develop, implement, and evaluate managerial strategies related to the management of human and material resources, fiscal services, information systems, policy, quality outcomes, and/or physical facilities in an integrative fashion.

NURS 244 CLINICAL PRACTICUM IN ADVANCED PEDIATRIC NURSING (1-5). Prerequisites: N223, permission of instructor. Supervised practicum in an advanced practice role in a selected health care setting that provides primary care and/or specialized health care to infants, children, or adolescents.

NURS 246 PSYCHIATRIC NURSING INTERVENTIONS WITH INDIVIDUALS (3). Prerequisite, NURS 224. Focuses on theories, techniques, and research related to providing individual psychotherapy. Contextual factors affecting the delivery of psychiatric-mental health nursing services are analyzed.

NURS 247 PSYCHIATRIC-MENTAL HEALTH NURSING INTERVENTIONS FOR FAMILIES AND GROUPS (3). Prerequisites, NURS 224, NURS 246, or permission of instructor. Students will analyze theories, techniques, and research relevant to therapy with families. Clinical placement with preceptors is used to apply knowledge.

NURS 248 PSYCHIATRIC-MENTAL HEALTH NURSING FOR UNDERSERVED POPULATIONS (3). Prerequisite, NURS 224, NURS 246, NURS 247, or permission of instructor. Utilizing epidemiology, psychoeducation, case manage-
ment, and health policy, students examine the scope of mental health problems and services for underserved populations.

NURS 253 SPECIALTY CARE IN THE HEALTH OF WOMEN (4). Prerequisites: NURS 226, NURS 229, NURS 212, or permission of instructor. Focuses on the primary care of women with complex gynecological problems, reproductive complications, and socially derived health care problems. Emphasis is placed on assessment, diagnosis, management, and clinical decision-making.

NURS 255 MANAGEMENT OF COMPLEX HEALTH PROBLEMS IN ADULTS (4). Prerequisites: NURS 142, NURS 226, NURS 229, NURS 210, NURS 213. This capstone course focuses on the management of complex health problems in adult populations for the adult nurse practitioner.

NURS 258 MANAGEMENT OF THE CRITICALLY ILL INFANT (4). Prerequisites; NURS 223. Prepares the advanced neonatal nurse to manage the high-risk neonate during the critical and convalescent phases of illness, including after hospital discharge.

NURS 259 PRACTICUM IN PRIMARY CARE MANAGEMENT OF ADULTS (1-2). Prerequisite: completion of NURS 226, NURS 210. A precepted practicum in community-based ambulatory care settings that provides experiences in continuity of care in the delivery of personal health services to adult individuals and their families.

NURS 262 EXTERNSHIP IN THE ADVANCED NURSING MANAGEMENT OF THE HIGH- RISK NEONATE (1-5). Prerequisites: NURS 258 (or concurrent). The advanced neonatal nurse manages the health needs of a caseload of high-risk infants and their families under the supervision of an experienced neonatal practitioner or physician.

NURS 269 ADVANCED CLINICAL PRACTICUM IN COMMUNITY ORIENTED PRIMARY CARE (2). Prerequisites: NURS 226, NURS 229, NURS 230, NURS 210, NURS 211, NURS 212. Introduction to supervised clinical practice in primary health care with emphasis on use of history, physical examination, and laboratory data to plan interventions for promoting and restoring health.

NURS 270 SPECIAL POPULATIONS PRACTICUM IN PRIMARY CARE NURSING (2). Prerequisites: NURS 226, NURS 229, NURS 230, NURS 269, NURS 211, NURS 212. This practicum focuses on an ambulatory practice population of interest, defined by specific characteristics such as age, disease, or vulnerability.

NURS 274 RESEARCH FOR NURSING PRACTICE I (3). This two course sequence explores the philosophy, logic, and methods of research and statistical analysis for use in clinical practice. This first course focuses on the relations between research and practice, the research process, and on non-experimental designs.

NURS 275 RESEARCH FOR NURSING PRACTICE II (3). Prerequisite, NURS 274. This two course sequence explores the philosophy, logic, and methods of research and statistical analysis for use in clinical practice. This second course focuses on sampling, measurement, data management, experimental designs, and the use of data for improving practice.

NURS 278 PRACTICUM IN PSYCHIATRIC MENTAL HEALTH CARE FOR ADVANCED PRACTICE NURSES (1-3). Prerequisites: NURS 244, NURS 246, or permission of the faculty. Students apply knowledge and skill in selected domains of the advanced practice of psychiatric-mental health nursing. Supervision, peer evaluation, and independent readings will enhance the experience.

NURS 392 RESEARCH PROJECT (3). Students engage in a research project in collaboration with faculty and under the direction of the thesis option advisor. A scholarly paper is required to reflect the project.

NURS 393 THESIS (3-6). Through the thesis, students independently pursue knowledge and understanding, develop competence in solving nursing problems, and increase recognition of possibility to contribute to professional knowledge by systematic investigation.

NURS 292 INTRODUCTION TO COMMUNITY PRACTICE (1). Introduces fundamental concepts and models of community-oriented nursing practice and the central issues affecting that practice. Focuses on underserved and rural communities.

NURS 293 RURAL COMMUNITY-ORIENTED PRIMARY CARE (3). Introduces principles of community-oriented primary care with rural underserved populations: health assessment, program planning and evaluation; culturally competent care; and effective and efficient practice management strategies.

Supporting Graduate Electives

NURS 113, 114 SPECIAL PROBLEMS (1-6). These courses are available to graduate and advanced undergraduate students. Their goal is to provide the student with opportunities to individualize work in an area of interest not regularly provided for by the ongoing nursing courses. The student studies under the direction of one or more faculty members who are knowledgeable in the area of the student's need and/or interest.

NURS 185 CARE OF THE DYING AND Bereaved Throughout the Life Span (3). Students from a variety of health sciences-related disciplines gain an understanding of issues in working with dying and bereaved individuals of all ages and their families.

NURS 187 ETHICAL ISSUES IN NURSING PRACTICE (2). Examination and discussion of major ethical issues arising in the professional practice of nursing in the context of systematic consideration of the nature of ethical choice.

NURS 284 SCIENTIFIC WRITING (1). Focuses on the principles and practice of scientific writing, with emphasis on research papers, theses, research reports, dissertations, and articles for publication. Spring.

NURS 290 PRINCIPLES OF TEACHING APPLIED TO NURSING (3). Provides students who have had no previous teaching experience with educational principles necessary to teach nursing. Opportunities for observation and analysis of undergraduate instruction are provided.

Doctor of Philosophy in Nursing

The discipline of nursing is concerned with the study of human experiences related to health, illness, and life transitions; and professional practices that enhance well being, promote a healthful life, prevent injury and disease, facilitate recovery from and stimulate adaptive responses to illness and disability, ameliorate the negative effects of the treatment of disease, and promote a dignified and peaceful death. The Ph.D. in Nursing Program at the University of North Carolina at Chapel Hill School of Nursing is designed to prepare scholars who will contribute to the science of nursing by expanding—generating, evaluating, and disseminating—knowledge in these areas for use by nurses and others concerned with health care.

With changes in demography, advances in technology, and changes in the social and economic mandate for health care, the faculty of the School of Nursing has chosen to emphasize scholarship in the prevention and management of chronic health conditions across the lifespan. Of particular interest are populations at special risk for developing chronic health problems and for suffering more intense morbidity and early mortality because of them. These populations are vulnerable to severe manifestations of disease by virtue of such factors as age, gender, geography, history, race/ethnicity, biological markers of risk, and/or socioeconomic class. The prevention of chronic health conditions involves activities that promote health and prevent disease. The management of chronic health conditions involves, in turn, assisting people in managing symptoms and side effects of diseases and their treatment, adjust well to their emotional, family, social, and other sequelae, and generally to live well with these conditions. Another priority area of study is the organizational context in which health services are delivered. This encompasses the study of the interactions among health care organizations, providers of care, processes of care, and recipients of care.
The Ph.D. Program in Nursing emphasizes study of the understanding of health conditions in varying biographical, cultural, historical, clinical, ethical/legal, and organizational contexts; and of practices to appraise health, improve health, and prevent health problems, and to evaluate the application of these practices in real-world settings across the continuum of care. Faculty help students link their clinical and research interests with the program emphasis. For example, students may focus their program of study on various kinds of chronic conditions, health-related social problems, or advanced biobehavioral measurement techniques. They may focus on studying and testing theories and concepts from nursing and other disciplines that address chronic conditions or the system of care. They may focus on population groups varying by gender, developmental level, race/ethnicity, or genetic predisposition. They may focus their study on specific theory-driven individual, family, or community-oriented interventions in the biobehavioral, psychosocial, psychoeducational, and/or technological domains. Or, they may focus on studies that seek to understand how to improve access to care, to investigate the effectiveness, costs, quality, and outcomes of organizational systems that provide services across the continuum of care.

The program emphasizes the value and capable use of a variety of methodological and analytic approaches from the biological, behavioral, and social sciences and the humanities; and interdisciplinary and participative collaboration with other scholars and affected populations. The overall goal of the program is to prepare competent, culturally sensitive, and compassionate scholars of nursing who will, through their active engagement with and passion for scholarship, contribute to the goal of a healthy nation.

**Doctoral Curriculum**

Doctoral students can expect to take two or three years of course work, in addition to completing a dissertation. The curriculum includes four components: a required core curriculum; a dissertation, a minor or secondary area of study, and elective (optional) courses. Recommended curriculum components are listed below.

The doctoral curriculum is designed to increase the understanding of chronic illness prevention and management and the health care system. Methodological course work includes quantitative and qualitative research methods, statistics, measurement, health policy, and theory development. Students also take additional nursing courses and five courses outside of nursing that support the development of a specific focus on a particular age or gender group, population level (families, individuals, communities), a particular response or intervention strategy, a particular disease entity, or nursing systems. Because of the rich resources of this campus, courses are available in fields such as psychology, sociology, anthropology, epidemiology, health policy and administration, and physiology.

**Required Core**

**NURS 281 KNOWLEDGE DEVELOPMENT IN NURSING** (3). Examines the origin and development of nursing knowledge, theories, and research testing nursing theories and models.

**NURS 335 THEORIES OF PREVENTION OF CHRONIC CONDITIONS** (3). Overview of theory and research related to the prevention of chronic conditions across the life span. Concepts such as health, illness, chronicity, risk, vulnerability, resilience, and disability are examined. (On request.) Staff.

**NURS 336 THEORIES OF MANAGEMENT OF CHRONIC CONDITIONS** (3). Examines theories and concepts related to the management of chronic illness including their historical evolutions, social-political influences, implicit assumptions, and biases. (On request.)

**NURS 352 NURSING, HEALTH ORGANIZATIONS, AND POLICY MAKING** (3). Interrelated responses of nursing, the organization of health care and policy over nurse leaders to public policies in policy making, with consequences for organizations, services, staffing, interorganizational linkages, and health of the public.

**NURS 370 ADVANCED STATISTICS I: PRINCIPLES OF REGRESSION AND CORRELATION** (3). Principles of bivariate and multivariate regression and correlations are studied. Emphasis is on the application of these techniques in the analysis of nursing and health-related data.

**NURS 371 ADVANCED STATISTICS II: PRINCIPLES OF ANALYSIS OF VARIANCE** (3). Principles of variance and covariance - univariate ANOVA, multiple ANOVA, ANCOVA, repeated measures ANOVA - are studied. Emphasis is on application of these techniques in the analysis of nursing and health-related data.

**NURS 376 ISSUES IN SAMPLING AND DESIGN FOR NURSING RESEARCH** (3). Discussion of critical analyses of methodologies and design. Qualitative measures, qualitative methods, design, and sampling are examined for the study of nursing phenomena.

**NURS 377 QUALITATIVE METHODS** (3). Examines the philosophical orientation and methods of qualitative techniques including grounded theory and phenomenology, consideration of research designs, ethical issues, issues of rigor, data collection, and analysis.

**NURS 378 PRINCIPLES OF MEASUREMENT** (3). Examination of measurement and techniques for assessing validity, reliability, and structure of data collection instruments. Instrumental construction and procedures for critical evaluation of instruments are included.

Six additional credits in the substance of nursing are required from those listed below.

**NURS 279 ORGANIZATIONAL THEORIES APPLIED TO NURSING** (3). Examines contemporary issues and programs in nursing systems. Students use a four-level nursing systems model to analyze programs of research related to systems.

**NURS 300 SPECIAL TOPICS IN NURSING**. (VAc.). Topics directed by an authority in the field.

**NURS 310 ISSUES IN PREDICTION, PREVENTION, AND AMELIORATION WITH INFANTS AND CHILDREN AT RISK** (3). Examines assessment and interventions for development delay or health problems in infants and children. Models, research methods are critiqued.

**NURS 335 THEORIES OF PREVENTION OF CHRONIC CONDITIONS** (3). See above.

**NURS 336 THEORIES OF MANAGEMENT OF CHRONIC CONDITIONS** (3). See above.

**NURS 338 FROM THEORY TO INTERVENTION IN CHRONIC CONDITIONS** (3). In-depth exploration of selected programmatic research in nursing and related fields on prevention and management of chronic conditions in order to generate and evaluate treatment theory and intervention protocol. Staff.

**NURS 339 FAMILIES AND HEALTH** (3). Theoretical, methodological, and ethical issues related to family research, including health promotion, risk reduction, vulnerability, and health risk, in the context of acute and chronic illness across the life span. (On request.) Staff.

**NURS 351 METHODS FOR THE EVALUATION AND IMPROVEMENT OF HEALTH CARE SYSTEMS** (3). Examines scientific methods that are employed to evaluate and improve health care systems.

**NURS 384 PROSEMINAR IN NURSING** (1-3). Proseminars are offered for 1, 2, or 3 credits. Topics differ each semester.

**NURS 394 DISSERTATION REGISTRATION** (At least 6).
Minor/Secondary Area of Study

Fifteen credits in a minor or secondary area of study that supports the student’s program are required. If a minor is declared, it must be in a department approved for the minor in the nursing doctoral program. A secondary area of study is an alternative to the minor and can be a cluster of courses from one or more departments. Minors and secondary areas of study are approved by the major adviser and the director of doctoral programs and an adviser from one of the other departments selected for study.

Elective (Optional) Courses

NURS 280 SOCIAL CONTEXT OF THE DISCIPLINE (3). Historical and contemporary analysis of selected topics related to the influence of ethics, economics, and societal imperative in shaping the profession and practice of nursing.

NURS 315 ANALYSIS OF THE ACADEMIC ROLE IN NURSING EDUCATION (3). Knowledge, theories, and skills necessary for transition into an academic teaching role in university schools of nursing. Particular emphasis on the teaching-learning process as used in higher education. Spring. Staff.

NURS 333 HEALTH AND POLICY (3). The course offers a combined theoretical-analytical and practice-focused discussion and experience on the relationship between current health issues and policy making.

NURS 337 DESIGNING INTERVENTION STUDIES (3). Examination of methodological, ethical, and practical issues in the design and implementation of research-based intervention studies. (Alternate years.) Staff.

NURS 379 QUALITATIVE ANALYSIS (3). Emphasizes the work of analysis and interpretation. Students apply relevant qualitative techniques to their own data.

NURS 380 OBSERVATIONAL METHODS (3). Explores quantitative observational research techniques. Strategies for developing coding systems, determining reliability and validity, and analyzing data are included.

NURS 385 RESEARCH SEMINAR AND PRACTICUM: GUIDED INDIVIDUAL RESEARCH EXPERIENCE (3-5). Directs students to develop research skills related to dissertation and future research.

Clinical Instructor

Linn Wakeford, Occupation-Centered Services for Infants and Preschoolers with Developmental Delay

Professor Emerita

Marlys M. Mitchell

The Division of Occupational Science in the Department of Allied Health Sciences offers a graduate program leading to the Master of Science degree with a major in Occupational Therapy. This is a two-year program designed for individuals with a baccalaureate degree in a field other than Occupational Therapy.

Requirements for Admission

1. Bachelor’s degree from an accredited institution.
2. Submission of Graduate Record Examination scores from the Educational Testing Service.
3. Academic record that demonstrates potential to do work at the graduate level.
4. Completion of the OT supplemental application.
5. The M.S. program has the following prerequisites:
   1. Human Anatomy (with lab)
   2. Introductory Human Physiology (with lab)
   3. Developmental Psychology across the Life Span
   4. Abnormal Psychology
   5. Sociology of the Family
   6. Statistics

   The Master of Science program requires a minimum of sixty-three semester credit hours. The program is twenty-four months in length and includes substantial fieldwork experience.

   Occupational Science courses are available only to graduate students enrolled in the OT program at the University.

Courses for Graduates

207 OCCUPATIONAL THERAPY PRACTICE ENVIRONMENTS (2). Overview of OT practice settings, professional organizations, regulatory bodies. Factors influencing practice, including legislation, reimbursement, documentation and culture of communities. Ethics, confidentiality, self-awareness, teamwork, and professionalism in practical settings. Fall. Coppola.


222 BIOMEDICAL AND PHENOMENOLOGICAL PERSPECTIVES ON ILLNESS AND DISABILITY (4). The biomedical and phenomenological aspects are presented and contrasted, using medical literature and personal narratives. Emphasis on humanistic values, biomedical information, and investigative reasoning for effective occupation-centered practice. Spring. Coppola.

228 OCCUPATIONAL AND ENVIRONMENTAL TRANSFORMATIONS II
(3). Prerequisite, OCCT 226. Age-related changes in occupational performance from infancy through adolescence. Developmental contextualism used to frame intrinsic changes and environmental influences. Fall. Humphrey.

248 FUNDAMENTALS OF OCCUPATION-CENTERED PRACTICE (4).
In-depth examination of core principles and methods involved in comprehensive occupational analysis, assessment of occupational performance, and therapeutic occupation across practice areas. Fall. Nielson and Wakeford.

250 OCCUPATIONS, ADAPTATION, AND TECHNOLOGY I (5).
Prerequisites, OCCT 226, 248. Problem-orientation approach to assessment, treatment planning, and use of clinical reasoning to develop intervention strategies. Remediative, compensatory, and adaptive approaches to physical and psychosocial dysfunction are explored through case studies. Spring. Dickie and Womack.


304 RESEARCH IN OCCUPATIONAL SCIENCE AND THERAPY (3).
Examination of research approaches and issues within occupational science and occupational therapy. Development of skills in writing research proposals and applying research results to insure evidence-based practice. Fall. Wood.

320A, 320B FIELDWORK II (6). Direct experience with clients/patients in varied service treatment settings. Experience will include adult disabilities (A) and a second experience in an area of special focus (B). Summer. Coppola.


338 POLITICAL, ADMINISTRATIVE, AND FINANCIAL CONTEXTS OF SERVICE DELIVERY (3). Exploration of public policies and regulations, administrative systems and skills, reimbursement and financial aspects of traditional service delivery system Fall. Staff.

342 HISTORICAL EVOLUTION OF OCCUPATIONAL THERAPY AND SCIENCE (3). This historical analysis of occupational therapy and occupational science centers upon questions of philosophical foundations, knowledge development, division of labor, and professionalism within health care. Spring. Wood.

344 EVOLUTION OF COMMUNITY-BASED PRACTICE: DEVELOPMENT, IMPLEMENTATION, AND EVALUATION (2). History and development of occupation-based services in community settings; evolution, structure, and operation of community programs; use of consulting and planning skills in a comprehensive and systematic planning model. Spring. Nielson.

350 INDEPENDENT STUDY: OCCUPATIONAL THERAPY AND SCIENCE (Vic.). Elective. Independent study to pursue specific interests and topics. Faculty supervision. May be repeated for credit. Fall, spring, summer. Baranek, Humphry, Wood, Coppola, Dickie.

DEPARTMENT OF OPERATIONS RESEARCH

VIDYADHAR G. KULKARNI, Chair

Professors
*Vidyadhar G. Kulkarni (14) Stochastic Models
*J. Scott Provan (20) Networks, Computational Complexity, Combinatorial Optimization

David S. Rubin (3) Integer Programming, Networks
*Sherly Siddham Jr. (21) Stochastic Processes, Control of Queues, Queueing Theory, Markov Decision Processes
Jayshankar Swaminathan (26) Supply Chain, Stochastic Models
*Jon W. Tolle (6) Optimization Theory
Harvey M. Wagner (19) Management, Strategic Thinking, Modeling

Assistant Professor
*Cabor Patoli (24) Convex Programming, Combinatorial Optimization, Integer Programming

Adjunct Associate Professor
Mark E. Hartmann (22) Combinatorial Optimization, Integer Programming, Polyhedral Combinatorics

Lecturer
Charles Dunn (27) Actuarial Models

Professor Emeritus
George S. Fishman
* emeritus

Operations Research is concerned with the process of decision making for the purpose of optimal resource allocation. The spectrum of related activities includes basic research in optimization theory, development of deterministic and stochastic mathematical models as aids for decision making, and application of these models to real world problems. The principal steps in modeling consist of analyzing relationships that determine the probable future consequences of decision choices and devising appropriate measures of effectiveness in order to evaluate the relative merits of alternative actions. During the past fifty years, Operations Research has developed as a mathematical science whose methods of analysis are regularly employed in many diverse industries and governmental agencies.

The Department of Operations Research consists of a resident faculty and an interdisciplinary faculty with programs of study that offer considerable opportunity for the pursuit of individual student interests. Both the M.S. and Ph.D. degrees are offered, with specialization possible in deterministic optimization theory (such as nonlinear and integer programming), in stochastic processes and applied probability (such as queueing theory and simulation), or in an approved area of application (such as management science). The M.S. program is intended for the student who is preparing for a career in industry, government, or consulting. The Ph.D. program emphasizes theoretical depth and is tailored primarily for the student who is preparing for a career in teaching and/or research. Each program includes study of the mathematical foundations of Operations Research. In either case the specific program of study for each student is determined to a large extent on an individual basis through consultations with a faculty adviser to obtain a balance between application and theory. Although it is possible for the well-prepared student to complete the M.S. requirements in three semesters, it more typically requires four semesters. The Ph.D. program, including the dissertation, generally requires four or five years past the bachelor's degree. The department offers a minor for Ph.D. students in other departments. The department also offers a course sequence that enables qualified UNC-Chapel Hill undergraduates in the Mathematical Sciences B.S. degree program to fulfill the requirements for the M.S. degree in Operations Research in one additional academic year beyond the four years required for the undergraduate degree.

Requirements for Admission to Graduate Study

Applicants must have demonstrated a high level of scholastic ability in their undergraduate studies and must satisfy the entrance requirements of the Graduate School. No restrictions are placed on the undergraduate major for admission to the department. However, to be prepared adequately for
study in Operations Research, an applicant should have a good mathematica-

cal background including courses in advanced calculus, linear or matrix alge-
bra, and probability, and the knowledge of a computer language. A student
admitted with a deficiency in one or more of these topics must make up for it
at the beginning of her or his graduate work. If the deficiency is not
severe, this can be accomplished without interrupting the normal program.

Degree Requirements

Candidates for degrees in Operations Research must meet the general
requirements of the Graduate School. Course selections for a degree in
Operations Research are taken from the department's offerings and from
regular offerings of related departments. In addition to the following cours-
es, selections can be made from the departments of Biostatistics, City and
Regional Planning, Computer Science, Epidemiology, Economics, Health
Policy and Administration, Information and Library Science, Mathematics,
Psychology, Statistics, and the Kenan-Flagler Business School.

Further information can be obtained from the department's homepage, or
from the Admissions Chair, Department of Operations Research, CB# 3180,
Smith Building, The University of North Carolina at Chapel Hill,
Chapel Hill, NC 27599-3180, or by e-mailing department@unc.edu.

Courses for Graduates and Advanced Undergraduates

140 DECISION MAKING USING SPREADSHEET MODELS (3). Prerequisite.
STAT 31 or BA 24 or MATH 22. The use of mathematics to describe and analyze
large-scale decision problems. Situations involving the allocation of resources, making
decisions in a competitive environment, and dealing with uncertainty are modeled
and solved using suitable software packages. Fall.

161 LONG TERM ACTUARIAL MODELS (MATH 161, STAT 106) (3).
Prerequisites, MATH 32, OR 41, and STAT 31. Probability models for long term
insurance and pension systems that involve future contingent payments and failure-
time random variables. Introduction to survival distributions and measures of inter-
est and annuities-certain. Fall. Dunn.

162 SHORT TERM ACTUARIAL MODELS (MATH 162, STAT 107) (3).
Prerequisite, STAT 126. Short term probability models for potential losses and their
applications to both traditional insurance systems and conventional business decisions.
Introduction to stochastic process models ofolvency requirements. Spring. Dunn.

181 DETERMINISTIC MODELS IN OPERATIONS RESEARCH (MATH
151) (STAT 181) (3). Prerequisite, Mathematics 147. Linear, integer, nonlinear
and dynamic programming, classical optimization problems, network theory. Fall.
Provan, Tolle.

183 STOCHASTIC MODELS IN OPERATIONS RESEARCH (3). Prerequisite,
BIOS 160 or STAT 126. Introduction to Markov chains, Poisson process, continu-
ous-time Markov chains, renewal theory. Applications to queuing systems, invento-
ry, and reliability, with emphasis on systems modeling, design, and control. Spring.
Kulkarni, Stidham.

190 COMPUTATIONAL MATHEMATICS FOR DECISION SCIENCES (3).
Prerequisite, permission of the instructor. Reviews basic mathematical and computa-
tional theory required for analyzing models that arise in operations research, man-
agement science, and other policy sciences. Solution techniques that integrate exist-
ing software into student-written computer programs will be emphasized. Fall.

211 LINEAR PROGRAMMING (3). Prerequisites, calculus of several variables,
linear or matrix algebra. The theory of linear programming, computational methods
for solving linear programs, and an introduction to nonlinear and integer program-
ing. Basic optimality conditions, convexity, duality, sensitivity analysis, cutting

212 MATHEMATICAL PROGRAMMING I (3). Prerequisites, OR 211 and
either OR 190 or MATH 191 or permission of the instructor. Advanced topics
from mathematical programming such as geometry of optimization, parametric
analysis, finiteness and convergence proofs, and techniques for large-scale and spe-
cially structured problems. Spring. Tolle.

213 MATHEMATICAL PROGRAMMING II (3). Prerequisite, OR 212 or per-
mission of the instructor. Advanced theory for nonlinear optimization. Algorithms
for unconstrained and constrained problems. Fall. (Alternate years) Tolle.

214 INTEGER PROGRAMMING (3). Prerequisite, OR 211 or permission of the instructor. Techniques for formulating and solving discrete valued and combinatori-
al optimization problems. Topics include enumerative and cutting plane methods,
Lagrangian relaxation, Benders' decomposition, knapsack problems, and matching
and covering problems. (Alternate years) Rubin.

215 NETWORKS (3). Prerequisite, OR 211 or permission of the instructor.
Network flow problems and solution algorithms; maximum flow, shortest route,
assignment, and minimum cost flow problems; Hungarian and out-of-kilter algo-
rithms; combinatorial and scheduling applications. Spring. Provan.

216 TOPICS IN DISCRETE OPTIMIZATION (3). Prerequisites, OR 212 and
permission of the instructor. Topics may include polynomial algorithms, computa-
tional complexity, matching and matroid problems, and the traveling salesman
problems. (Alternate years) Provan.

217 COMPUTATIONAL METHODS IN MATHEMATICAL PROGRAM-
MING (3). Prerequisites, OR 212 and permission of the instructor. Advanced top-
ics such as interior point methods, parallel algorithms, branch and cut methods, and
subgradient optimization. (Alternate years) Provan.

220 STOCHASTIC MODELS IN OPERATIONS RESEARCH I (3).
Prerequisite, STAT 126 or equivalent. Review of probability, conditional probabil-
ity, expectations, transforms, generating functions, special distributions, functions
of random variables. Introduction to stochastic processes. Discrete-time Markov

221 STOCHASTIC MODELS IN OPERATIONS RESEARCH II (3).
Prerequisite, OR 220 or equivalent. Exponential distribution and Poisson process.
Birth-death processes, continuous-time Markov chains; transient and limiting
behavior. Applications to elementary queuing theory. Renewal processes and regen-

222 STOCHASTIC MODELS IN OPERATIONS RESEARCH III (3).
Prerequisite, OR 221 or equivalent. Intermediate queuing theory, queueing net-
works. Reliability. Diffusion processes and applications. Markov decision processes
(stochastic dynamic programming); finite horizon, infinite horizon, discounted and

223 QUEUEING NETWORKS (3). Prerequisite, OR 221 or permission of the instructor. Jackson networks; open and closed. Reversibility and quasi-reversibility.
to computer performance evaluations and telecommunication networks. (Alternate
years) Kulkarni.

224 CONTROL OF STOCHASTIC SYSTEMS IN OPERATIONS RESEARCH
(3). Prerequisites, OR 220 and OR 221. Review of Markov decision processes.
Monotone control policies. Algorithms. Examples: control of admission, service,
routing, and scheduling in queues and networks of queues. Applications: manufac-
turing systems, computer/communication systems. (Alternate years) Stidham.
225 INTRODUCTION TO INVENTORY THEORY (3). Prerequisite, permission of the instructor. Introduction to the techniques of constructing and analyzing mathematical models of inventory systems. (On demand.) Wagner.


233 DISCRETE EVENT SIMULATION (3). Prerequisites, STAT 127 and OR 220, or the equivalent and familiarity with computer programming. Introduces students to modeling, programming, and statistical concepts applicable to discrete event simulation on digital computers. Emphasizes statistical analysis of simulation output. Students model, program, and run simulations. Fall. Fishman.


241 SCHEDULING THEORY (3). Prerequisites, OR 181 or 211; and OR 183, OR 220 or STAT 129. Sequencing in flow and job shops. Stochastic scheduling. Buffers, setups, just-in-time policies. Emphasis on formulation of mathematical models. Applications to production lines, flexible manufacturing, and computer communication systems. (On demand.) Stidham.

245 DECISION THEORY (3). Prerequisite, OR 210 or equivalent. Decision theory. Subjective probability and utility theory. Introduction to decision analysis, statistical decision theory. Game theory. (On demand.)

250 DECISION ANALYSIS (3). Prerequisite, STAT 126 or equivalent. Material on decision analysis from texts and papers of Howard, Raiffa, and others. Extensive, normal forms of analysis, subjective probability, utility theory. Analysis of specific decision problems. Orientation to applications. (On demand.)

321 DIRECTED READING IN OPERATIONS RESEARCH AND SYSTEMS ANALYSIS (Var.). Prerequisite, permission of Operations Research faculty member. Fall and spring. Staff.

350 OPERATIONS RESEARCH PRACTICE (3). Prerequisites, OR 211, 220, 233, and permission of the instructor. Gives students an opportunity to work on an actual operations research project from start to finish under supervision of a faculty member. Intended exclusively for Operations Research students. Spring.

351 SPECIAL TOPICS IN OPERATIONS RESEARCH AND SYSTEMS ANALYSIS (Var.). Prerequisite, permission of the instructor. Fall and spring. Staff.

389 OPERATIONS RESEARCH AND SYSTEMS ANALYSIS STUDENT SEMINAR (1). Survey of literature in operations research and systems analysis. Spring. Staff.

392 MASTER'S SUBSTITUTE FOR THESIS (Var.). Prerequisite, permission of the adviser. Fall and spring.

393 MASTER'S THESIS (3 or more). Prerequisite, permission of the student's adviser. Fall. Staff.

394 DOCTORAL DISSERTATION (3 or more). Prerequisite, permission of the student's adviser. Fall and spring. Staff.

**DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE**

J. CHARLES JENNETTE, Chair
James D. Foldes, Vice Chair for Clinical Services
Thomas W. Bouldin, Vice Chair for Faculty and Training Development
David G. Kaufman, Vice Chair for Research Development

**Professors**

Nadja Maluf Anderson (26) Muscle Diseases, Membrane Repair in Muscle Injury

Dwight A. Bellinger (89) Laboratory Animal Medicine, Comparative Pathology

Stuart A. Bentley (88) Hematopoiesis, Bone Marrow Microenvironment

Thomas W. Bouldin (72) Neuropathology, Ocular Pathology, Neurotoxicology

Mark E. Barcher (128) Blood Component Processing and Storage, Transfusion Strategies, Transfusion Transmitted Diseases

John F. Chapman Jr. (79) Laboratory Practice, Clinical Chemistry

Frank C. Church (107) Molecular Pathology, Thrombosis and Hemostasis, Breast and Prostate Carcinogenesis, Macromolecular Structure-Function

Herbert A. Cooper (154) Experimental Pathology, Hemophilia

Maria Cordeiro-Stone (96) DNA Replication, DNA Repair, Cell Cycle

Checkpoints in Human Cells, Mechanisms of Mutagenesis and Carcinogenesis

Ronald J. Falk (172) Glomerular Disease, Lupus, Vasculitis, Dialysis

Rosalind A. Farber (118) Genetic Instability in Cancer, Human Molecular Genetics, Microsatellite Instability, Fragile X Mental Retardation

Susan A. Fiscus (123) Retrovirology

James D. Folds (155) Immunophenotyping of Human Lymphocytes, Flow Cytometry, Immune Response to Infectious Organisms and Immunoneuroimmunology

Donald T. Forman (59) Clinical Chemistry, Alcohol Metabolism, Pediatric Metabolic Diseases

Peter H. Gilligan (174) Diagnostic Bacteriology, Pulmonary Disease in Cystic Fibrosis, Toxin Mediated Diarrheal Disease

Thomas R. Griggs (50) Blood Coagulation, Atherosclerosis

Joe W. Graham (1) General and Experimental Pathology, Cell-Cycle Regulation, Mechanisms of Carcinogenesis

John E. Hammond (47) Application of Tools of Information Management to Problems in Medicine and Pathology

J. Charles Jennette (61) Renal Pathology, Immunopathology

David G. Kaufman (54) Molecular and Cellular Biology of Chemical Carcinogenesis

William K. Kaufmann (93) Human DNA Metabolism and Cancer

Suzan T. Lord (94) Macromolecular Structure-Function, Molecular Genetics

Nobuyoshi Maeda (116) Molecular Genetics of Atherosclerosis, Transgenic Laboratory Animals as Model Systems, Molecular Evolution

James L. Mohler (175) Prostate Cancer

Timothy C. Nichols (156) General Cardiology, Cardiac Catheterization, Per-Cutanous Transluminal Coronary Angioplasty

Howard M. Reiner (38) Immunogenetics of Blood Coagulation, Immunoochemistry

Lawrence M. Silverman (73) Molecular Pathology/Genetics

Gary J. Smith (85) Genomic Instability, Cancer Cell-Microenvironmental Interaction, Aging

Oliver Smithies (115) Molecular Pathology, Genetically Engineered Animal Models of Human Disease, Targeted Mutagenesis

Darrel W. Stafford (127) Molecular Biology

Kiyoko I. Suzuki (110) Neuropathology, Genetic Neurological Disorders

James A. Swenberg (66) Chemical Carcinogenesis, Toxicology

Richard R. Tidwell (42) Medicinal Chemistry, Antiviral and Antimicrobial Agents, Protease Inhibitors

Michael D. Topal (41) Molecular Genetics, Chemical Mutagenesis/Carcinogenesis

Bernard E. Weissman (119) Tumor Suppressor Genes

**Associate Professors**

William B. Coleman (139) Biology of Liver Stem Cells, Hepatocarcinogenesis, Lung and Breast Carcinogenesis, Epigenetics and Cancer

Myra L. Collins (97) Transfusion Medicine, Medical Ethics

Georgette A. Dent (117) Hematopathology, Medical Education

Cherie H. Dunphy (189) Anatomic Pathology, Clinical Pathology

Cora-Jean S. Edgell (84) Tissue Proteoglycan Structure and Function, and Endothelium-Specific Gene Expression

Margaret L. Golley (196) Molecular Diagnostics, Oncology, Epstein-Barr Virus

J. Ed Hall (177) Infectious Diseases, Pathogenic Protozoa, Drug Metabolism

Jean Handy (178) Diagnostic Virology and Parasitology, Biology of Malaria Parasites and Antimalarial Drugs
Scott E. Kilpatrick (160) Surgical Pathology, Cytopathology, Pathology of Bone and Soft Tissue Tumors
Susan J. Maygarden (131) General Surgical Pathology, Cytopathology, Prostate Carcinogenesis
Volker Niederle (190) Renal Pathology, Fibronectin
Katherine B. Papyrsky (86) Cell Biology of Phagocyte Functions
W. Eugene Sanders (176) Diffusiblization, Pacing Platelets
Harsharan K. Singh (186) Cytopathology, Fine Needle Aspiration Biopsy
John T. Woodley (133) Dermatopathology, Hepatobiology and Gastrointestinal Pathology, Histopathologic Assessment of Prognosis

Assistant Professors
Lanier H. Aycue (146) Drug Resistance in Leukemia
Nicholas Bandarenko III (149) Transfusion Medicine, Apheresis, Thrombocytic Thrombocytopenic Purpura, Idiopathic Thrombocytopenic Purpura
William K. Funkhouser Jr. (152) Surgical Pathology, Molecular Pathology, Immunology
Catherine Hammack-Stabler (171) Clinical Chemistry, Toxicology, Clinical Pharmacology
Suzanne L. Kirby (181) General Hematology/Oncology and Bone Marrow Transplantation
Ruth A. Linninger (166) Surgical Pathology, Breast Pathology
Chad A. Livasy (193) Surgical Pathology
Christopher P. Mack (188) Cardiovascular Disease
John L. Schmitz (168) Flow Cytometry, HIV, Diagnostic Immunology, Sexually Transmitted Diseases
Scott V. Smith (164) Vascular Biology, Cardiovascular Pathology, Platelet and von Willebrand Factor Pathophysiology
Jean M. Taylor (187) Adhesion Signaling, Cardiovascular Disease
Herbert C. Whina (167) Thrombosis and Hemostasis, Breast and Prostate Carcinogenesis

Clinical Professors
John D. Burns (70) Forensic Pathology, Injury Prevention
Harold R. Roberts (15) Thrombosis and Hemorrhage Research and Therapy, Hematology

Clinical Associate Professors
Thomas B. Clark III (134) Forensic Pathology, Computer Applications in Forensic Medicine
Pamela A. Groben (157) Surgical Pathology, Cytopathology, Dermatopathology

Clinical Assistant Professors
Jessica K. Booker (199) Genetics, Breast Cancer
Amy Peace Brewer (170) Hepatitis C Virus, Molecular Diagnostics, HIV, Flow Cytometry
Jeri R. Miller (191) Forensic Toxicology
David B. Thomas (192) Nephropathology, Neuropathology, Gynecologic Pathology
Ruth E. Wiencek (165) Forensic Pathology

Research Professors
Henry A. Azer (161) History of Pathology
Virginia L. Godfrey (148) Veterinary Pathology, Animal Models of Genetic Disease, Autoimmunity

Research Associate Professors
C. Robert Bagnell Jr. (109) Application of Advanced Light and Electron Microscopy to Research in Basic Medical Sciences
Thomas H. Fischer (169) Gene Therapy, Blood Coagulation, Atherosclerosis
Hyoung-Suk Kim (137) Gene Targeting and Animal Models for Human Diseases, Hypertension and Hereditary Central Hemorrhage with Amyloidosis and Molecular Evolution

Research Assistant Professors
Kenneth J. Friedman (183) Cystic Fibrosis, Genetic Disorders
Oleg V. Gorkun (195) Coagulation, Fibrinolysis, Fibrinogen Structure

Tracey M. Heeman (163) Laboratory-, Exotic-, and Companion-Animal Medicine
Scott L. Trasti (197) Comparative Pathology, Phenotypic Evaluation of Mutant Mice, Clinical Laboratory Animal Medicine
Nobuyuki Takahashi (184) Hypertension, Gene Therapy
Alisa Sue Wolkery (198) Thrombosis Research

Adjunct Professors
J. Carl Barrett (75) Chemical and Environmental Carcinogenesis, Carcinogenesis of Mammalian Cells in Culture
Byron Butterworth (67) Genetic Toxicology
Robert R. Manonpor (140) Mechanisms of Carcinogenesis
Stephen C. Nesnow (39) Chemical Carcinogenesis, Environmental Toxicology
Paul Nettlesheim (65) Pulmonary Function and Toxicology

Adjunct Associate Professors
Gary A. Boorman (102) Toxicological Pathology, Myelotoxicology
Jeffrey L. Everitt (180) Experimental Pulmonary and Toxicology Pathology
Kevin T. Morgan (103) Nasal Toxicology
Richard S. Paules (144) Oncogene Tumor Suppressor Genes and Cell Cycle Control in Neoplastic Transformation of Mammalian Cells
Roger W. Wiseman (141) Molecular Genetics and Carcinogenesis
Douglas C. Wolf (185) Mechanisms of Toxicity and Carcinogenesis

Adjunct Assistant Professors
Thomas L. Goldsworthy (143) Mechanism of Chemical Carcinogenesis
Susan C. Hadler (194) Oral Diagnosis

Professors Emeriti
Robert E. Cross
Frederic G. Daldorf
J. Dieter Geratz
John B. Graham
William D. Huffines
William W. McLendon
Marjorie S. Read
Richard W. Shermer
Robert L. Thompson

Graduate work in the Department of Pathology is offered to those interested in acquiring more extensive knowledge of diseases and their effects at different levels of molecular and cellular organization. Major emphasis is given to investigation of molecular mechanisms responsible for disease processes. Students are given the opportunity to undertake candidacy for the Doctor of Philosophy degree. Participation in research activities leading to an original dissertation is required of all advanced degree candidates. Prospective candidates must hold a bachelor's degree from an accredited college.

The department is located in the Brinkhous-Bullitt Building, and offers well-equipped laboratories for research and advanced work in pathology.

Courses for Graduates and Advanced Undergraduates

0656 HISTORY OF DISEASE (3). First-year undergraduate seminar. Plagues and people. An introduction to the social history of plagues and the motif of plagues in a variety of contemporary and historical writing. An opportunity to read and respond to works presented as historical, fictional, and scientific writing. Spring. Reisner.

0808 BIOLOGY OF HUMAN DISEASE (Biology 080) (3). Open to all undergraduates and graduates. No prerequisites. Presents an overview of basic human molecular and cellular biology in the setting of common human diseases. The course emphasizes how an understanding of disease mechanisms provides the knowledge base for informed use of modern health care. Fall. Reisner, Smith. BA-level and General College-level natural science (no lab) perspectives.
134 BIOLGY OF BLOOD DISEASES (Biology 134) (3). Prerequisite, Biology 52 or permission of the instructor. An introduction to the biology and pathophysiology of blood and the molecular mechanisms of some human diseases, including malignant neoplasms, anemias, hemophilia, thrombophilia, arteriosclerosis, and viral infections. Fall. Church.

161f GENERAL PATHOLOGY (5). Prerequisites, Cell Biology 102 and permission of the instructor. Basic aspects of pathology, including cell injury, cell death, tissue inflammation, necrosis, repair, and carcinogenesis. Circulatory, respiratory, renal, reproductive, and immune systems are also studied. Two lecture, one seminar and seven laboratory hours a week. Fall. Staff.

161t SYSTEMIC PATHOLOGY (2). Prerequisites, Cell Biology 102, Pathology 161f, and permission of the instructor. Pathology of the nervous, digestive, and endocrine systems. One lecture, one conference, and one laboratory hour a week. Spring. Staff.

162 EXPERIMENTAL PATHOLOGY. Hours, credits, and instructor to be arranged on an individual basis. This course involves hands-on research experience in a predetermined instructor's laboratory. Students have the opportunity to learn and apply specific techniques, and to participate in investigations of molecular mechanisms responsible for disease processes (pathobiology). Contact director of Graduate Studies in Pathology for more information. May be repeated. Staff.

163 ELECTRON MICROSCOPY (4). Prerequisite, permission of the instructor. Theoretical and practical aspects of electron microscopy. Application of transmission and scanning electron microscopy to pathology, with emphasis on ultrastructure of cells and organelles. Two lecture and six laboratory hours a week. Fall. Bagnell.

164 LIGHT MICROSCOPY (3). Prerequisite, permission of the instructor. Course focuses on practical fundamentals of light microscopy including optics, contrast mechanisms, fluorescence, laser scanning confocal microscopy, photography, and digital imaging. Three lecture hours a week. Spring. Bagnell.

174 ADVANCED HUMAN GENETICS (Genetics 174) (3). Prerequisites, graduate students; a previous course in genetics or permission of the instructor; undergraduates: a previous course in genetics and permission of the instructor. Topics in human genetics, including the molecular basis of genetic disease, special methods used in human genetics research, and molecular genetic principles learned from studies of humans. Three lecture hours a week. Fall. (Alternate years) Faber.

178 HUMAN DNA METABOLISM (2). Prerequisite, a basic biochemistry course. This course examines the molecular biology of DNA replication, recombination, and repair as these processes occur in human cells. Two seminar hours per week. Fall. (2003 and alternate years) Kaufmann.

Courses for Graduates

213 MECHANISMS OF DISEASE (2, 3, or 5). Prerequisite, cell biology, histology, or permission of the course director. A graduate course on cell injury and pathogenesis of disease with emphasis on basic mechanisms at the molecular, cellular, and organ system levels. Three lecture hours (3 credits) and a 2 1/2 hour laboratory (2 credits) each week. Spring. Edgell.

214A HISTORY OF MEDICINE: EVOLUTION OF CONCEPTS OF HEALTH AND DISEASE - PART I (2-3). Prerequisites, background in philosophy or biology and permission of the course director. Study of major epochs and schools of medical thought with emphasis on the evolution of concepts in health and disease. Fall. Azar.


223 SPECIAL METHODS IN PATHOLOGY (2). Prerequisite, permission of the instructor. Conducted on a tutorial basis, with the aim of providing experience with specialized techniques including histochemistry, electron microscopy, fluorescent and phase microscopy, chromatography, electrophoresis, and ultracentrifugation. Two seminar hours per week, including clinical experiences. Spring. Weissman/Maynard.

225 CANCER PATHOLOGY (3). Permission of the course director required. This course examines pathobiological features of cancer. An interdisciplinary approach drawn from epidemiology, genetics, molecular biology, and clinical medicine to investigate cancer etiology, pathogenesis, prevention, and treatment. Three lecture hours a week, optional two laboratory hours a week. Spring. Kaufmann.

250 DATA ANALYSIS (Pharmacology 250, Toxicology 250) (1). Data analysis for biomedical scientists. This largely self-study course deals with basic statistical and quantitative methods for the analysis and interpretation of biomedical data. This course is required for PHCO/TOXC/PATH graduate students. Permission of the instructor is required for other students. Fall. Nicholas.

292 SEMINAR IN CARCINOGENESIS (Toxicology 292) (2). Prerequisite, permission of the instructor. Survey of classical and current literature on selected critical issues in carcinogenesis. Students discuss experimental methods and observations as well as theories and generalizations. Two seminar hours a week. Spring. Coleman.

301 SEMINAR IN PATHOLOGY (2). This course emphasizes the development of written and oral scientific communication skills. It is designed specifically for first and second year graduate students within the department. Fall. Edgell.

302 RESEARCH IN PATHOLOGY (2-12). Prerequisite, permission of the department. This is a research course in which advanced students in pathology carry on investigations on mechanisms of disease. Six or more laboratory hours a week, to be arranged. May be repeated. Fall, spring, and summer. Staff.

393 MASTER'S THESIS (Vat.). Fall, spring, and summer. May be repeated. (Total maximum of six credits.) Staff.

394 DOCTORAL DISSERTATION (Vat.). May be repeated. Fall, spring, and summer. Staff.

DEPARTMENT OF PHARMACOLOGY

RUDOLPH L. JULIANO, Chair

Professors
*George R. Breese (15) Drugs and Neural Plasticity; Molecular Neurobiology
*Frank C. Church (107) Proteases and Their Inhibitors Involved in Regulating Thrombosis and Tumor Cell Invasion
Fulton T. Crews (68) Excitotoxicity, Gene Delivery, Neuroprogenitor Stem Cells and Addiction
Channing Der (74) Ras Protein Superfamily, Signal Transduction and Oncogenesis
Kenneth H. Dudley (28) Drug Biotransformation, Penicillin Hypersensitivity
*Linda Dykstra (55) Opioid Analgesics; Drugs of Abuse
*H. Sheldon Earp (63) Growth Regulation, Growth Factor and Protein Kinases
Barry Goo (29) Virus and Cancer Chemotherapy
T. Kendall Harden (37) Receptor Biochemistry, Regulation of Second-Messenger Signaling
*Larry G. Johnson (113) Gene Therapy, Epithelial Ion and Macronuclear Transport
Rudolph L. Juliano (62) Membrane Biochemistry of Cell Interactions, Drug Delivery Systems
*J. Stephen Kizer (54) Molecular and Cellular Biology of Post-Translational Processing
Ryszard Kole (57) RNA Splicing, RNA-Protein Interactions, Antisense Oligonucleotides
*Richard B. Malim (52) Neuropharmacology, Structure and Function of Dopamine Receptors, Molecular Drug Design
*William Mainzer (64) Pain Research and Autonomic Nervous System Research
Ken D. McCarthy (42) Neuronalglial Interactions Studied in situ Using Electrophysiology, Confocal Imaging and Conditional Knockouts
Professors Emeriti
Hugh J. Burford
John T. Gatz
Philip P. Hirsch
Tom S. Miya
Paul L. Munson
William Henry Pearlman
Doris T. Poole
Roy V. Talmage
Sven U. Toverud
* joint faculty member

The Department of Pharmacology offers a program of study that leads to the degree of Doctor of Philosophy. The curriculum is individualized in recognition of the diverse backgrounds and interests of students and the broad scope of the discipline of pharmacology. The basic course requirements for the Ph.D. degree include introductory and advanced courses in pharmacology and related programs in accord with the principal interest of the students in molecular pharmacology, neuropharmacology, or in toxicology. In addition, in order to satisfy the requirements of the department and the Graduate School, the student must pass written and oral doctoral examinations, write a dissertation based on original research, and submit to a final oral examination. Under special circumstances, the department will offer a program leading to the M.S. degree. The requirements are appropriate course work, a written comprehensive examination, a thesis based on original research, and a final oral examination.

The department offers a variety of research areas including: 1) receptors and signal transduction; 2) ion channels; 3) neuropharmacology; 4) cancer pharmacology; 5) gene therapy; and 6) pharmacology of alcohol and drugs of abuse. The student is expected to begin independent research early in his or her training and to participate in an intensive program of research seminars. Close personal contact between preceptor and trainee is encouraged.

Research Facilities
Laboratory facilities and a wide variety of research equipment are available in the department, which is located primarily in the Mary Ellen Jones Building where it occupies approximately 26,000 square feet exclusive of classrooms and animal facilities. In addition, several faculty members are located in the Lineberger Comprehensive Cancer Center, the Thurston Bowles Alcohol Center, and the Neurosciences Hospital.

Assistantships and Other Student Aid
Financial assistance is provided to all students. The stipend is currently $18,000 per year. In addition, tuition, fees, and health insurance coverage are provided.

Requirements for Admission
The Department of Pharmacology will consider applications from interested students who have or expect to receive a bachelor's degree in a scientific discipline. Applications may be made at any time during the year, but consideration for fall admission is given to those sent by January 1.

Courses for Graduates
117 CELL STRUCTURE, FUNCTION, AND GROWTH CONTROL I (Cell Biology 117) (Var). Prerequisites, undergraduate cell biology or biochemistry or permission of instructor. Comprehensive introduction to cell structure, function, and transformation. Fall. Cox, Jacobson, Lee, Meissner.
118 CELL STRUCTURE, FUNCTION, AND GROWTH CONTROL II (Cell Biology 118) (Var.). Prerequisites: undergraduate cell biology or biochemistry or permission of instructor. Comprehensive introduction to cell structure, function and transformation. Spring. Cox, Jacobsen, Lee, Meisner.

202 PRINCIPLES OF PHARMACOLOGY AND TOXICOLOGY (Toxicology 202) (S). Prerequisites: Biochemistry 100 and Physiology 140, or their equivalents and permission of the instructor. Introduces students to the major areas of pharmacology and toxicology and serves as a basis for more advanced courses. Five lecture hours a week. Spring. McCarthy.

205 THE MOLECULAR PHARMACOLOGY OF CANCER (2). Prerequisites, advanced graduate or advanced undergraduate courses in biochemistry and molecular biology. This course deals with the molecular and cellular basis of anticancer and antiviral chemotherapy, with emphasis on novel approaches including immunotherapy, antisense oligonucleotides, and gene therapy. The course includes faculty lectures and student presentations. Fall. Kole.

207 ADVANCED TOXICOLOGY (Toxicology 207) (S). Prerequisite, Pharmacology 202 or permission of the course director. Cellular and physiological basis of toxicity of environmental chemicals, with emphasis on inhalation toxicology, developmental toxicology, immunotoxicology, radiation toxicology, renal toxicology, and neurotoxicology. Three lecture hours a week. Fall. Toxicology. Svenberg.

211, 212 INTRODUCTION TO PHARMACOLOGICAL RESEARCH (Var.). A course for first-year graduate students majoring in pharmacology. A series of research projects of limited scope, under the supervision of a different faculty member. Twelve laboratory hours a week. Fall and spring. Kole.

213 INTRODUCTION TO PHARMACOLOGICAL RESEARCH (Var.). Prerequisites, Pharmacology 211 and 212. This is a continuation of Pharmacology 211 and 212. Six laboratory hours a week, first summer session. Kole.

214 INTRODUCTION TO PHARMACOLOGICAL RESEARCH (Var.). Prerequisites, Pharmacology 211, 212, and 213. This is a continuation of Pharmacology 211, 212, and 213. Six laboratory hours a week, second summer session. Kole.

221 SEMINAR COURSES IN PHARMACOLOGY (1-3). This is a series of seminar courses dealing with advanced topics in modern molecular pharmacology based mainly on discussion of current literature.

221A RAS SUPERFAMILY PROTEINS AND SIGNAL TRANSDUCTION (2). Seminar/discussion course covering recent advances in the role of these proteins in signaling and growth. Fall. (Alternate years) Der, Cox.

221B SIGNAL TRANSDUCTION (2). Seminar/discussion course on molecular aspects of the receptors, G-proteins, effector proteins, kinases, and phosphatases that mediate hormone, neurotransmitter, growth factor, and sensory signaling. Spring. (Alternate years) Harden.

221C ADHESION RECEPTORS AND SIGNALING IN CANCER AND CV DISEASE (2). Examines the growing number of families of cell adhesion receptors and their role in biological processes including signal transduction, control of gene expression, hemostasis, cancer, neuronal development, immunobiology, and embryologic development. Spring. (Alternate years) Juliano/Puris.

221D STRUCTURE AND FUNCTION OF ION CHANNELS (2). Seminar/discussion course on the physiology, pharmacology, biochemistry, and molecular biology of ion channel proteins. Spring. (Alternate years) Rosenberg, Oxford.


221G DRUG DISCOVERY AND DEVELOPMENT (2). A seminar/discussion course on the research, development, and regulatory processes involved in bringing new drugs to clinical use. Spring. (Alternate years) Carl.

221H PAIN AND ANALGESIA (2). A lecture/discussion course on pain transmission and pain measurement. The neuropharmacological basis of pain modulation will be discussed. Fall. (Alternate years) Maizer, Dykes, Hollins, Light.

221I DISCOVERY BIOLOGY AND PHARMACOGENOMICS (2). Lecture/discussion course covering a variety of aspects of new biological and computational technologies. The course is predominantly in a lecture format with computer-based and literature assignments. Spring. (Alternate years) Siderevski, Sondel.

222 CELLULAR AND MOLECULAR NEUROBIOLOGY I (Neurobiology 222) (Var.). Lecture/discussion course on the physiology, pharmacology, biochemistry, and molecular biology of the nervous system. Topics include: function and structure of ion channels, neurotransmitter biosynthesis and release mechanisms, neurotransmitter receptors, and intracellular signaling pathways. Fall. Rosenberg.

223 CELLULAR AND MOLECULAR NEUROBIOLOGY II (Neurobiology 223) (Var.). Lecture/discussion course on the physiology, pharmacology, biochemistry, and molecular biology of the nervous system. Topics include: function and structure of ion channels, neurotransmitter biosynthesis and release mechanisms, neurotransmitter receptors, and intracellular signaling pathways. Spring. Rosenberg.

250 DATA ANALYSIS FOR BIOMEDICAL SCIENCES (Pathology 250) (Toxicology 250) (1). This largely self-study course will deal with basic statistical and quantitative methods for the analysis and interpretation of biomedical data. This course is required for pharmacology, toxicology, and pathology graduate students. Permission of instructor is required for other students. Fall. Nicholas.

290 SEMINAR IN NEUROBIOLOGY (Biochemistry 290) (Neurobiology 290) (Pathology 290) (Physiology 290) (3). Prerequisites, one graduate course in the biological sciences and permission of the director of the Neurobiology Program. An intensive consideration of selected topics and problems. Spring. Members of the Neurobiology Program.

301 RESEARCH IN PHARMACOLOGY (5 or more). Prerequisite, permission of the staff. Fall, spring, and summer. Nicholas.

310 RESEARCH IN NEUROBIOLOGY (Biochemistry 310) (Neurobiology 310) (Pathology 310) (Physiology 310) (Psychology 310) (Biology 310) (3-12). Prerequisite, permission of a staff member of the Neurobiology Program. Research in various aspects of neurobiology. Six to twenty-four hours a week. Fall and spring. Members of the Neurobiology Program.

330 SEMINAR IN RECENT ADVANCES IN PHARMACOLOGY (1). Students meet as a group with faculty members to develop skills in critical reading and to summarize and discuss selected aspects of current pharmacological literature. Two hours a week. Fall and spring. Cox, Sondel.

331 SEMINAR IN GENERAL PHARMACOLOGY (1). A series of weekly lecture-seminars by graduate students, faculty members, and visiting scientists on current research in pharmacology. One hour a week. Fall. Carl.

332 GRANT WRITING (2). Prerequisites, Pharmacology 201 and permission of course director. A discussion course covering the elements of successful grant proposals and scientific ethics. Spring. Juliano.

393 THESIS FOR MASTER'S DEGREE (3 or more). Prerequisite, permission of the staff. Fall, spring, and summer.

394 DOCTORAL DISSERTATION (3 or more). Prerequisite, permission of the staff. Fall, spring, and summer.
**SCHOOL OF PHARMACY**

**WILLIAM H. CAMPBELL, Dean**

**Professors**


William H. Campbell (83) Pharmacoepidemiology, Pharmacy and Health Care Policy, Pharmacy Manpower

Dale B. Christensen (105) Pharmacy and Drug-Related Outcomes Research, Drug Policy, Patient Compliance, Pharmacoepidemiology

Frederick M. Eidel (9) Exploration and Role Development of Pharmacists as Health Team Members

B. W. Hadziiska (19) Analysis of Drugs and Their Metabolic Degradation Products

Iris H. Hall (15) Anticancer Drug Mechanisms

Anthony J. Hickey (86) Pulmonary Drug Delivery, Aerosol Formulations

Harold Kohn (106) Organic, Medicinal, and Bio-Organochemistry, Mechanisms of Biochemical and Biomedical Processes, Synthesis and Investigation of Heterocyclic Compounds of Medicinal Interest

Kuo-Hsing Lee (13) Medicinal Chemistry of Bioactive Natural Products and Synthetic Analogues Including Antitumor, Anti-AIDS, Antimarial, Antihypertensive, Anti-inflammatory, Anti-arthritic and Anti-Viral Agents; Antifungal Antibiotics; Insect Antifeedants; Chinese Herbal Medicine

John A. Pieper (93) Cardiovascular Pharmacokinetics and Pharmacodynamics

Gary M. Pollack (53) Pharmacokinetics and Pharmacodynamics of CNS Active Agents, Pharmacokinetic Model Development, Toxicokinetics

Dhirerr R. Thakker (87) Mechanisms of Drug Transport, Pro-drug Strategies for Enhanced and Targeted Drug Delivery, Disposition of Macromolecules (e.g., Genes)

**Associate Professors**

Kenneth F. Bastow (84) Design and Testing of Antiviral/Anti-Cancer Drugs

Raymond G. Booth (72) Ligand-Based Characterization of Brain Receptor Systems in Schizophrenia, Parkinson's Disease, and Alzheimer's Disease

Stephen M. Caiaola (14) Evaluation of Pharmacy Service Delivery Models and Therapeutic Regimens in Ambulatory Care Settings

Stanley W. Carson (66) Pharmacokinetics and the Pharmacodynamics of Psychotropic Drugs

Moo J. Cho (79) Targeted Drug Delivery

J. Ed Hall (109) Development of Anti-Parasitic and Anti-Viral Agents

Timothy J. Ives (90) Ambulatory Care, Pharmacy Practice

Richard J. Kowalsky (61) Radiopharmaceuticals

Celeste M. Lindley (58) Pharmacogenetics, Pharmacokinetics, and Pharmacodynamics of Antineoplastic Agents and Cosolvent Products; Drug Metabolism

Gordon G. Liu (107) Pharmaceutical Economics, Medicare Reform, Medication Errors in the Elderly

J. Herbert Patterson (47) Pharmacokinetic Evaluation of Cardiovascular Drugs

A. Wayne Pittman (30) Hypertension, Clinical Pharmacokinetics, Cardiology and Drug Administration

Ralph H. Raasch (32) Infectious Diseases, Parenteral Nutrition

Robert P. Shrewsbury (29) Biopharmaceutics

Betsy J. Sleahey (91) Provider-Patient Communication, Drug Utilization Review, Patient Compliance, Pharmacoepidemiology

Philip C. Smith (85) Pharmacokinetics, Drug Metabolism

Alexander Tropea (81) Molecular Modeling, Computer-Assisted Drug Design, Molecular Dynamics of Proteins, Protein Folding

Dennis M. Williams (92) Pharmacokinetics and Pharmacodynamics, Inhalation Therapy for Pulmonary Disease, Hypertension

**Assistant Professors**

Angela Kashuba, Pharmacogenetics, Pharmacokinetics and Pharmacodynamics of Antiretroviral Agents, Influence of Cytokines on Drug-Metabolizing Enzymes

Jeffrey P. Krise, Intracellular Trafficking, Subcellular Drug Delivery, Prodrug Strategies

Jill Lavigne, Health Policy: Economics, the Influence of Work on Health

Ed LeClerc (95) Hepatic Drug Disposition and Regulation of Drug-Metabolizing Enzymes

Andrew Lee, Structural Biology, NMR Spectroscopy, Protein Dynamics, Biophysical Dissection of Proteins and Protein-Ligand Interactions

Jian Liu (108) Carbohydrate Biochemistry, Structural and Functional Relationships of Heparan Sulfate

Rhe Liu, Proteomics and Functional Genomics

Jo Ellen Rodgers, Cardiovascular and Critical Care Drug Therapy

Scott R. Smith (101) Outcomes Research, Pharmacy Administration

**Research Assistant Professors**

Julie Mohn, Pediatrics, Medication Errors


**Clinical Professors**

Gary M. Armstrong, Public Policy, Deception in Advertising, Sales Force Management

Allen E. Cato, Clinical Drug Trials, Pediatric Diseases, and Pulmonary Medicine

J. Heyward Hull, Cardiovascular Pharmacology, Clinical Pharmacokinetics, Study Design and Analysis

Arnold D. Kaluzny, Organizational Behavior, Innovation Diffusion, Medical Care

**Clinical Associate Professors**

Robert E. Dupuis, Clinical Pharmacokinetics, Transplantation

Deborah Morehouse, Cardiovascular Drug Therapy

J. Robert Powell, Clinical Pharmacokinetics and Drug Metabolism

William N. Zelman, Health Finance

**Clinical Assistant Professors**

Kimberly H. DeLellis, Educational Media and Instructional Design

Colleen Gresham, Drug Utilization Review

**Adjunct Professors**

Michael C. Cory, Design, Synthesis, and Binding Studies of DNA Intercalating Agents, Qualitative Structure-Activity Relationships, Computer Applications to Drug Design

Arnold Kaluzny, Health Policy

Andrew T. McNeill, X-ray Crystal Structure Analysis of Naturally Occurring Compounds and Their Analogs, Synthesis and Structural Studies of Born-Containing Amino Acids and Peptide Analogs

James Swarth, Physical Pharmacy, Biopharmaceutics

Hugh H. Tilson, Pharmacoepidemiology

Raymond J. Townsend, Pharmacoeconomics

**Adjunct Associate Professors**

Kuan Chue, Receptor Binding Involving Estrogen and Other Synthetic Estrogenic Compounds

James Crow, Pulmonary and Hematology Inflammation

Donald K. Knight, Pharmaceutical Industry

Thomas R. Conrad, Primary Care, Health Services Research

John E. Paul, Pharmacoeconomics, Health Policy, Pharmacoepidemiology

Sue Tolleson-Rinehart, Health Policy

**Adjunct Assistant Professors**

Karen R. Brouwer, Drug Metabolism; Pharmacokinetics

Michael O. Calloway, Mental Health, Substance Abuse

Robert A. Casper, Evaluation and Development of Polymeric Materials for Use in Controlled Drug Delivery and Novel Primary Drug Packaging

Lawrence L. Gail, Drug Metabolism, Pharmacokinetics

William Gillespie, Theoretical and Computer Analysis of Pharmacokinetic Systems

S. Frances Gualtieri, Infusion Therapy, Intravenous Admixture Systems

Roseanne C. Jewell, Clinical Pharmacokinetics, Protein Binding

Keith A. Johnson, Research and Development in Chemical Engineering, Biloid and Interface Science, Aerosol Science, and Pharmaceutical Science

Stanley Levy, Cosmetic Science and Technology
The School of Pharmacy offers graduate curricula leading to the Master of Science and Doctor of Philosophy degrees in Pharmaceutical Sciences. Graduate study may be concentrated in disciplinary areas represented by the Divisions of Drug Delivery and Disposition, Medicinal Chemistry and Natural Products, Pharmaceutical Policy and Evaluative Sciences, and Pharmacotherapy.

Instruction emphasizes contemporary research methods and results and is given by means of lectures, recitations, and seminars combined with intensive laboratory-based research. The excellent rapport that exists between schools, departments, institutes, and centers within the University facilitates interdisciplinary collaborative research by graduate students and faculty. The graduate degree programs also benefit from faculty affiliations with GlaxoSmithKline, Inc., the Research Triangle Institute, Duke University, Bowman Gray School of Medicine, and many other organizations in the Research Triangle Park area.

The School of Pharmacy occupies Beard Hall, which is located on the Health Sciences campus, together with the Schools of Dentistry, Medicine, Nursing, and Public Health. The Health Sciences Library has an outstanding collection of books and journals as well as computer/support services. Appropriate use also is made of the library and laboratory facilities in other University departments.

Drug Delivery and Disposition

Drug Delivery and Disposition represents interdisciplinary specialties encompassing a range of scientific endeavors, including (1) the design, fabrication, evaluation, use of, and delivery strategies for dosage forms; (2) elucidation of the behavior of pharmacologic agents in biologic systems; (3) determination of the ability of pharmacologic agents to reach the relevant site of biologic effect; and (4) determination of the time course of biologic activity. These areas of specialization represent critical steps in the development of new therapeutic agents, the evaluation of new and existing drugs, and the optimal clinical use of pharmacologic agents.

Students in the Division of Drug Delivery and Disposition are required to participate in a common core of entry-level graduate courses. This core provides a broad perspective of the pharmaceutical sciences, as well as an appreciation for how different subspecialties interact. Building upon this core, students then specialize, through advanced coursework and research, in one of two areas of concentration within the division: pharmacokinetics/pharmacodynamics or targeted drug delivery. Many dissertation projects are collaborative in nature and rely upon interactions with faculty in other divisions of the School of Pharmacy, as well as with colleagues in the School of Medicine, the Department of Chemistry, or at pharmaceutical companies or institutions located in Research Triangle Park, NC.

Medicinal Chemistry and Natural Products

Medicinal Chemistry is an interdisciplinary science. It applies and extends the basic concepts of chemistry, biochemistry, and pharmacology to the investigation of biomedicine problems. Areas of study include structure-activity relationships, drug-receptor interactions, and synthetic drug design. Medicinal Chemistry may include biochemical mechanisms of drug interaction and drug toxicity, isolation of compounds from natural sources, and development of analytical methods that apply to all of the above areas of research. Specific research programs within the division focus on isolation of bioactive natural products and synthesis of related analogs, computational chemistry and molecular modeling, neurobiological proteins as targets for drug design, NMR-based techniques to study proteins, proteonomics, and nuclear protein enzymology.

Medicinal Chemistry is a multidisciplinary field that requires understanding of organic chemistry and related biomedical disciplines such as biochemistry, molecular biology, structural biology, pharmacology, and physiology. It interfaces with each of these disciplines and with the use of current methodologies, focusing on learning disease pathways and how drugs function. Research techniques including synthesis, spectroscopy, biochemistry, molecular biology, and computational chemistry are linked to identify new therapeutic agents, targets, and the pathways by which drugs express their functions. Along with other important facilities, the division has specialized laboratories that conduct cutting-edge research. Focus groups include cancer chemotherapy, computer-aided drug design, enzymology, glycomics, molecular modeling, natural products, neurochemistry, parasitology, and structural biology.

M.S. and Ph.D. programs are offered.

Pharmaceutical Policy and Evaluative Sciences

Research and education in Pharmaceutical Outcomes Research in the Division of Pharmaceutical Policy and Evaluative Sciences emphasizes an interdisciplinary approach to solving problems of developing, evaluating, and distributing pharmaceutical products and services. Faculty research interests and course offerings reflect this interdisciplinary orientation.

Education and research in the division draws heavily upon expertise in numerous fields such as health policy, epidemiology, economics, and health behavior. PPES emphasizes research in evaluation of pharmaceutical care and/or pharmaceutical technologies. This includes assessment of processes and outcomes of care from economic, humanistic, and clinical perspectives. Assessing and valuing outcomes in the pharmaceutical area is a vital part of the broader mission to improve the performance of the health care system. This is often exemplified in the formation and evaluation of drug policies.

Pharmacotherapy

The Division of Pharmacotherapy, in conjunction with the Division of Drug Delivery and Disposition, offers a Ph.D. program in the pharmaceutical sciences with a focus on experimental therapeutics. The goal of this program is to develop an individual who is capable of conducting translational research and integrating biomedical and pharmaceutical sciences while maintaining expertise as a clinician. The focus of the program is the development of basic research skills that facilitate evaluation of mechanisms of disease processes and drug therapy. In addition, ongoing clinical experience and advanced course work in pharmacotherapy are integral parts of this program. Students work closely with faculty members who play an active role in the In Vitro In Vivo Correlates of Drug Disposition Scholarly Program, which utilizes preclinical models of absorption, distribution, metabolism, and elimination to predict the in vivo disposition of therapies.
tic agents. Strong therapeutic areas include oncology, infectious diseases/HIV, cardiology, and neuropsychopharmacology. Core course work includes molecular biology, biostatistics, analytical methodology, and advanced pharmacokinetics/pharmacodynamics. Research projects must include an in vitro and an in vivo component. The student's dissertation committee will include faculty members from both divisions of pharmacotherapy and Drug Delivery and Disposition.

Requirements for Admission

Applicants who have completed a standard collegiate curriculum in pharmacy, chemistry, biochemistry, biology, zoology, or in an allied field in the University, or in other universities or colleges having curricula acceptable to the UNC Graduate School are eligible for admission to the School of Pharmacy graduate program. Applications for admission must be supported by scores on the Graduate Record Examination, letters of recommendation, and a statement of personal goals as they relate to graduate study at UNC School of Pharmacy.

The UNC-Chapel Hill Graduate School on-line application (gradschool.unc.edu) is the preferred means of applying for admission. Inquiries concerning admission to programs in the pharmaceutical sciences may be directed to the Office of Graduate Education and Scholarship, CB# 7360, 102 Beazell Hall, Chapel Hill, NC 27599-7360.

Graduate Assistantships and Fellowships

Graduate teaching and research assistantships in the School of Pharmacy provide a stipend of $16,500 for twelve months' service. All awards are given on a competitive basis with consideration given to the applicant's academic record and Graduate Record Examination scores. Information concerning these assistantships, fellowships, and traineeships may be obtained by writing directly to the Office of Graduate Education and Scholarship, School of Pharmacy.

**DRUG DELIVERY AND DISPOSITION**

Courses for Graduates and Advanced Undergraduates

107 NUCLEAR PHARMACY I (3). Prerequisites, PHCY 61 and permission of the instructor. Basic principles of radiation physics, instrumentation, radiation safety, and radiation biology. Fall. Kowalsky.

108 NUCLEAR PHARMACY II (3). Prerequisites, DDD 107 and permission of the instructor. Chemical principles underlying the preparation, regulatory control, and use of radioactive drugs in nuclear medicine. Spring. Kowalsky.

155 DRUG METABOLISM (3). Prerequisite, permission of the instructor. Introduction to the use of concepts, chemistry, enzymology, and techniques in drug metabolism for the design and development of safe and effective therapeutic agents. Spring, odd years. LeCleare, Thakker.

156 PRINCIPLES OF PHARMACOKINETICS (3). Prerequisites, PHCY 72 or equivalent, permission of the instructor. Introduction to pharmacokinetic theory, mathematical model development, and data analysis techniques. Fall, odd years. Pollack, Brouwer.

165 ADVANCES IN DRUG DELIVERY (4). Prerequisites, BIOC 100 or equivalent, PHCY 51, 50, or equivalent, CHEM 130 or equivalent, permission of the instructor. Elucidation of physicochemical and transport properties of the drug molecule as the determinant of method and route of drug delivery. Fall, even years. Cho.

171 INTRODUCTION TO RESEARCH (1-3). Prerequisite, permission of the instructor. Students participate in research projects designed to introduce them to research opportunities in the pharmaceutical sciences. Fall, spring, summer. Staff.

191 PHARMACEUTICAL ANALYSIS (1). Permission of the instructor. Introduction to quantitative instrumental analysis in pharmaceutics. One lecture hour a week. Fall, even years. Smith.

Courses for Graduates

253 SPECIAL TOPICS IN DRUG DELIVERY AND DISPOSITION (Var.). Prerequisite, permission of the instructor. A lecture and/or laboratory course designed to present new concepts and innovations in the area of drug delivery and disposition. Fall and spring. Staff.

254 SPECIAL TOPICS IN ADVANCED DRUG DELIVERY AND DISPOSITION (Var.). Prerequisite, permission of the instructor. A lecture and/or laboratory course designed to present new concepts and innovations in drug delivery and disposition. Spring. Staff.

256 ADVANCED PHARMACOKINETICS/PHARMACODYNAMICS (4). Prerequisites, DDD 156, permission of the instructor. Advanced treatment of contemporary pharmacokinetic theory and application, with emphasis on model development, analytical approaches to parameter estimation, and experimental design/data analysis. Spring, even years. Pollack, Brouwer.

265 TRENDS IN DRUG DELIVERY RESEARCH (3). Prerequisite, DDD 165. An interactive course in which students actively participate in critical evaluation and discussion of current literature in the field of drug delivery. Spring, odd years. Staff.

361 SEMINAR (1). Fall, spring. Staff.

391 RESEARCH (Var.). Graduate course consisting of laboratory-based research, conferences with the major professor, and library investigations related to research. One conference and nine laboratory hours a week per course. Fall, spring. Staff.

393 MASTER'S THESIS (3 or more). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

**MEDICINAL CHEMISTRY**

Courses for Graduates and Advanced Undergraduates

121 CHEMISTRY OF NATURAL PRODUCTS (3). Prerequisites, CHEM 166 or equivalent and permission of the instructor. An introduction to the isolation, structure determination, biosynthesis, and synthesis of bioactive natural products; emphasis on aspects relating to medicinal chemistry. Three hours a week. Spring or fall. Lee and staff.

141 INTRODUCTION TO RESEARCH IN MEDICINAL CHEMISTRY (1-3). Prerequisites, CHEM 61, 62, permission of the instructor. One conference and three or more laboratory hours a week. Fall and spring. Staff.

151 BIOMEDICINAL CHEMISTRY (3). Prerequisites, MEDC 68, 69, or permission of the instructor. Principles of genetic regulation and disease that alter drug disposition. Adverse effects of drugs on the regulatory mechanisms of cell metabolism, immunodefense, reproduction, and disease states. Fall or spring. Staff.

153 BASIC CONCEPTS OF CANCER AND ITS THERAPY (3). Prerequisites, PHCY 324 or BIOC 130, PHCO 55, 56, 216, PHPR 76, 77, PhDY 93, or equivalents. The etiology, pathogenesis, types, chemotherapy and immunotherapy, detection, prevention, management, therapy, and adverse effects of cancer in man are discussed. Three lecture hours a week. Fall or spring. Hall.

156 BIOINFORMATICS (1). This course covers applications of modern information theory and information technologies to biomolecular systems. The core of this course is an overview and practical applications of methods and techniques for the analysis of nucleic acid and protein sequences, sequence-structure, and sequence-function correlations.
Courses for Graduates

168 CONCEPTS OF DRUG DISCOVERY AND DESIGN (3). Prerequisites, CHEM 61, 62, 161, BIOM 130, PHYI 140. Introduction to the principles of design and discovery of effective therapeutic agents. Concepts of physical chemistry, pharmacokinetics and disposition, and analytical techniques in the context of drug design. Spring. Staff.

202 MEDICINAL CHEMISTRY TUTORIAL (TBA). Prerequisites, none. Tutorial in Medicinal Chemistry based upon variable credit taken in other appropriate courses. Fall and spring. (On request.)

241 SPECIAL PROBLEMS IN MEDICINAL CHEMISTRY (1-3). Prerequisites, CHEM 61, 62 and permission of the instructor. Fall and spring. Staff.

243 SELECTED TOPICS IN SYNTHETIC ORGANIC MEDICINAL CHEMISTRY (2). Prerequisite, CHEM 160 or equivalent. Discussions from current literature on the strategy and techniques involved in the synthesis of drug molecules. Two lecture hours a week. Spring and fall. Lee and staff.

244 SELECTED TOPICS IN NATURAL PRODUCTS (2). Prerequisites, CHEM 166 and 168. Discussions of important recent developments in the chemistry of natural products of biomedical significance. Spring. Lee and staff.

270 ADVANCED MEDICINAL CHEMISTRY (2). Prerequisites, MEDC 168, 169, or equivalents and permission of the instructor. Student presentations and discussion of pertinent scientific literature. Fall. Staff.

275 MOLECULAR MODELING (3). Prerequisites, MATH 31-32, CHEM 181, permission of the instructor. Introduction to Computer-Assisted Molecular Design (CAMD) of small molecules. Emphasis on the practical use of molecular and quantum mechanics programs (MM2, MNDO, GAUSSIAN). Two lecture and three to four laboratory hours a week. Fall. Tropsha.

276 MACROMOLECULAR MODELING (3). Prerequisites, MATH 31-32, CHEM 130 or equivalent. Introduction to modeling and simulation techniques for biological macromolecules. Two lecture and three to four laboratory hours per week. Spring. Tropsha.

361 SEMINAR (1 each). Fall and spring.

391 RESEARCH IN PHARMACEUTICAL POLICY AND EVALUATIVE SCIENCES (1-6). Consists of laboratory work, conferences with the major professor, and library investigations relating to research. Fall, spring, and summer. Staff.

393 MASTER'S THESIS (3). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3-5). Fall and spring. Staff.

PHARMACEUTICAL POLICY AND EVALUATIVE SCIENCES

Courses for Graduates

185 CARDIOVASCULAR PHARMACOLOGY (3). Provides an in-depth discussion of the pharmacology of major cardiovascular diseases such as hypertension, ischemic heart disease, heart failure, and arrhythmias. Fall. Patterson.

201 ADVANCED CLINICAL PHARMACY (3). Discussions, workshops, and lectures to develop the student's skills and abilities to make therapeutic recommendations, utilize drug literature, educate patients and health professionals, and record observations, plans, and actions in a problem-oriented record. Fall, spring, Lindsey.

210 THE DEVELOPMENT AND CLINICAL INVESTIGATION OF DRUGS (2). Includes preclinical drug safety evaluation, preclinical pharmacology, design of protocols for Phases I-IV. FDA guidelines for clinical study, preparation of study plan, statistics in clinical trials, data analyzing, and FDA interactions with industry. Fall. Caso.

211 DESIGN AND ANALYSIS OF CLINICAL DRUG TRIALS (2). Discussion of approaches to data analysis of clinical drug studies. Common study designs and their implementation are reviewed. Two lecture hours a week. Spring. Staff.

249 HOSPITAL PHARMACY AND THE HOSPITAL ORGANIZATION (3). This course covers the principles in health care delivery and their impact on the role of the hospital. Students discuss the hospital as an organized unit for the delivery of health care and review ways in which the pharmacist might contribute to the hospital's role. Fall. Ecker.

250 PRINCIPLES OF PHARMACY PRACTICE (3). Prerequisite, PHPR 249. Students discuss the modern role of the hospital pharmacist and how the role integrates progressive management with innovative services. The problems with implementing these programs are evaluated. Three lecture hours a week. Spring. Ecker, Sawyer.

251 CASE STUDIES IN INSTITUTIONAL PHARMACY PRACTICE I. PERSONAL DEVELOPMENT AND HUMAN RESOURCE MANAGEMENT (2). Prerequisites or corequisites, PHPR 249 and 250, permission of the instructor. Lecture, background readings, analysis of case studies and group discussions regarding contemporary issues in personal development and personnel management pertinent to pharmacy services in inpatient and ambulatory health care facilities. Two lecture hours a week. Fall. Caiola.
252 CASE STUDIES IN INSTITUTIONAL PHARMACY PRACTICE II: FINANCIAL AND OPERATIONS MANAGEMENT (2). Prerequisites or corequisites: PHPR 249, permission of the instructor. Lecture, background readings, analyses of case studies, and group discussions regarding contemporary issues in financial and operations management pertinent to pharmacy services in inpatient and ambulatory health care facilities. Two lecture hours a week. Spring, Johnston.

391, 392 RESEARCH IN PHARMACY PRACTICE (1-5). Consists of conferences with major professor; library, laboratory and/or field investigations relating to research. Professor in charge is responsible for the assignments and approval of the subject and character of the degree paper. Staff.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

PHARMACEUTICAL SCIENCES (INTERDISCIPLINARY)

195 RESEARCH METHODS (2). Overview of the research process, including hypothesis testing, scientific writing, construction of research proposals and research ethics. Fall. Staff.

DEPARTMENT OF PHILOSOPHY

GEOFFREY SAYRE-MCCORD, Chair

Professors
Dorit Bar-On (29) Philosophy of Language, Philosophy of Mind, Epistemology
Bernard Borill (26) Social and Political Philosophy
Michael Corrado (1) Philosophy of Law, Political Philosophy
Don J. Garrett (36) History of Modern Philosophy, Metaphysics
Thomas E. Hill Jr. (24) Ethics, Political Philosophy
Douglas C. Long (8) Philosophy of Mind, Ethics, Epistemology
William G. Lycan (22) Philosophy of Mind, Philosophy of Language, Epistemology
Douglas MacLean (38) Moral Theory, Social and Political Philosophy
Stanley Munsat (9) Philosophy of Mind, Epistemology, Cognitive Science
Gerald J. Posner (20) Legal Philosophy, Political Philosophy, Ethics
C. D. C. Reeve (39) Ancient Philosophy, Metaphysics, Moral Psychology, Ethics
Michael D. Resnik (11) Logic, Philosophy of Mathematics, Decision Theory
Jay F. Rosenberg (12) Epistemology, Metaphysics, Recent Analytic Philosophy
Keith Simmons (27) Logic, Philosophy of Language, Philosophy of Mind
Susan Wolf (40) Moral Theory and Moral Psychology

Associate Professors
Edward M. Galligan (5) Ancient, Medieval, Recent Analytic Philosophy
Richard H. Zaffron (16) Philosophy of the Social Sciences

Assistant Professor
John T. Roberts (37) Philosophy of Science, Philosophy of Physics, Metaphysics

Lecturers
Warren A. Nord (34) Philosophy of Religion, Philosophy of Education
Jeanette M. Boxill (33) Social and Political Philosophy, Feminism

Professors Emeriti
E. M. Adams
George Schlesinger
Richard A. Smyth
Robert D. Vance
Paul Ziff

The Department of Philosophy offers programs of study leading to the degrees of Master of Arts and Doctor of Philosophy. Prerequisite for admission to graduate work in the department is a B.A. degree or equivalent, normally with a major in philosophy, with courses in logic, ethics, and ancient and modern philosophy.

Candidates for the master's degree must satisfactorily complete thirty semester hours of graduate work. They are normally required to participate in a first-year program including Philosophy 300 and, for students intending to proceed to the doctorate, Philosophy 101; there may be adjustments with the consent of the department. Successfully passing a written comprehensive examination and completing an M.A. thesis are conditions for receiving the degree of Master of Arts.

Candidates for the doctoral degree must satisfactorily complete fifty-four semester hours of graduate work, including three hours of Ph.D. dissertation credit.

The candidate for the degree of Doctor of Philosophy must pass three examinations. First, the student must pass the comprehensive examination for the degree of Master of Arts mentioned above. Second, there is the Admission to Candidacy examination that consists of a written general portion and a special oral portion. The written portion, normally taken in the spring term of the third year, is in the student's field of specialization. The oral portion tests the feasibility of the dissertation proposal and is normally taken in the fall term of the fourth year. Finally, there is an oral defense of the completed dissertation. For further details on degree requirements, see the Graduate Degree Requirements section of this catalog.

The department offers several non-service fellowships. These include a Graham Kenan Fellowship and the Horace Williams, Mary Taylor Williams, and Bertha Colton Williams Fellowships. The department has available teaching assistantships with stipends of $12,500. Also, the Graduate School offers a variety of fellowships and assistantships with stipends up to $18,000 that are open to students in philosophy.

The department maintains close relations with the Department of Philosophy at Duke University. Graduate students in either institution may register for credit in graduate courses or seminars at the other institution for a nominal fee and without special matriculation. Combined library facilities are available to students at each institution.

Courses for Graduates and Advanced Undergraduates
(Please contact the department for more information.)

101 SYMBOLIC LOGIC (Linguistics 104) (3). Fall. Resnik, Simmons.


103 PHILOSOPHY OF ART (3). Fall or spring. Staff.

104 HEIDELBERG, MARX, AND THE PHILOSOPHICAL CRITIQUE OF SOCIETY (3). Fall or spring. Postema.

105 POLITICAL PHILOSOPHY FROM HOBBES TO Rousseau (3). Fall or spring. Boxill, Hill.

106 PHILOSOPHY OF MATHEMATICS (3). Prerequisite: Philosophy 101 or equivalent background in logic or mathematics. Fall or spring. Resnik, Simmons.

107 PHILOSOPHY, HISTORY, AND THE SOCIAL SCIENCES (3). Fall or spring. Zaffron.

108 PHILOSOPHY OF NATURAL SCIENCES (3). Fall or spring. Roberts.

109 PHILOSOPHICAL PROBLEMS IN PSYCHOLOGY (3). Fall or spring. Lycan, Zaffron.
110 PHILOSOPHY OF LANGUAGE (Linguistics 110) (3). Fall or spring. Bar-On, Lycan, Munzar.

111 ADVANCED SYMBOLIC LOGIC (3). Fall or spring. Resnik, Simmons.

112 CONTEMPORARY MORAL PHILOSOPHY (3). Fall or spring. Hill, Sayre-McCord, Wolf, MacLean.

113 PHILOSOPHY OF LAW (3). Fall or spring. Corrado, Postema, Sayre-McCord.

114 THE BEGINNINGS OF ANALYTIC PHILOSOPHY (3). Fall or spring. Rosenberg, Lycan.

115 FOUNDATIONS OF MATHEMATICS (3). Fall or spring. Resnik.

116 CURRENT ISSUES IN ANALYTIC PHILOSOPHY (3). Fall or spring. Bar-On, Lycan, Munzar, Reeve, Rosenberg.

117 PHILOSOPHY OF MIND (3). Fall or spring. Bar-On, Long, Lycan.

120 CONTEMPORARY MORAL AND SOCIAL PROBLEMS (3). Fall or spring. B. Boxill, Corrado, Hill, MacLean, Sayre-McCord, Wolf.

121 SPACE AND TIME (Physics 113) (3). Spring. Roberts.

130 RECENT DEVELOPMENTS IN POLITICAL PHILOSOPHY (3). Spring. Postema, B. Boxill, MacLean.

142 PHILOSOPHY IN LITERATURE (Comparative Literature 142) (3). Fall or spring. Reeve.

145 HISTORY OF AESTHETICS (3). Spring.

150 PLATO (3). Fall or spring. Galligan, Reeve.

151 ARISTOTLE (3). Fall or spring. Galligan, Reeve.

152 TOPICS IN MEDIEVAL PHILOSOPHY (Religion 132) (3). Fall or spring. Galligan, Reeve.

153 CONTINENTAL RATIONALISM (3). Fall or spring. Munsat, Garrett.

154 BRITISH EMPIRICISM (3). Fall or spring. Garrett, Munsat, Sayre-McCord.

155 KANT (3). Fall or spring. Rosenberg, Hill.

156 HEGEL (3). Fall or spring. Postema.

158 EXISTENTIALISM AND PHENOMENOLOGY (3). Fall or spring.

159 TOPICS IN AMERICAN PHILOSOPHY (3). Fall or spring. B. Boxill.

165 FEMINIST PHILOSOPHY: ISSUES IN GENDER, RACE, AND CLASS (Women's Studies 165) (3). Prerequisites: Philosophy 46, Women's Studies 50 or permission of instructor. Spring. J. Boxill.

168 RISK MANAGEMENT (3). Fall or spring. MacLean.

178 HEALTH CARE, SCIENCE, AND PHILOSOPHY (Physical Therapy 178) (3). Fall, Mitchell.

190 SET THEORY AND LOGIC (3). Fall or spring. Resnik, Simmons.

Courses for Graduates

201 STUDIES IN LOGIC (3). Advanced. Prerequisite, Philosophy 101 or equivalent; Philosophy 111 recommended. May be repeated for credit. Fall or spring. Resnik, Simmons.

203 METAPHYSICS (3). May be repeated for credit. Fall or spring. Rosenberg, Garrett, Roberts, Simmons.

204 EPistemology (3). May be repeated for credit. Fall or spring. Long, Lycan, Reeve, Rosenberg, Sayre-McCord.

205 VALUE THEORY (3). May be repeated for credit. Fall or spring. Hill, MacLean, Sayre-McCord, Wolf.

206 STUDIES IN CONTEMPORARY ANALYTIC PHILOSOPHY (3). May be repeated for credit. Fall and spring. Lycan, Munzar, Rosenberg.

207 STUDIES IN THE PHILOSOPHY OF SCIENCE (3). May be repeated for credit. Fall or spring. Lycan, Roberts, Rosenberg, Sayre-McCord.

208 NORMATIVE ETHICAL THEORY (3). May be repeated for credit. Fall or spring. Hill, MacLean, Sayre-McCord, Wolf.

209 TOPICS IN FEMINIST THEORY (Women's Studies 209) (3). Fall or spring. J. Boxill, Wolf.

212 ADVANCED PROBLEMS IN PHILOSOPHY OF LANGUAGE (Linguistics 212) (3). Fall or spring. Bar-On, Lycan, Munzar.

213 LEGAL PHILOSOPHY (3). Fall or spring. Corrado, Sayre-McCord.

300 PROTO-SEMINAR IN PHILOSOPHY (3). For first-year graduate students in the department. Fall or spring. Staff.

304 SEMINAR IN HISTORY OF PHILOSOPHY (3). May be repeated for credit. Staff.

305 SEMINAR IN SYSTEMATIC PHILOSOPHY (3). May be repeated for credit. Fall and spring. Staff.

310 LINGUISTICS AND PHILOSOPHY (Linguistics 310) (3). Fall or spring. Bar-On, Lycan, Munzar.

311 READINGS IN PHILOSOPHY (3). May be repeated for credit. Fall and spring. Staff.

393 MASTER'S THESIS (3 or more). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

DIVISION OF PHYSICAL THERAPY

DARLENE K. SEKERA, Director

Professors
Carol A. Giuliani (28) Neural Basis of Motor Control, Developmental Motor Control, Movement Analysis
Michael T. Gross (29) Biomechanics, Sports Medicine and Orthopedics, Research Design

Associate Professors
Barry R. Howe (3) Organization and Administration, Therapeutic Agents
Philip L. Wirt (22) Research Design, Orthopedics, Spinal Dysfunction

Assistant Professors
Janet K. Fehrerger (45) Health Sciences Research, Research Design, Biomechanics, Orthopedics
Vicki S. Mecshe (40) Motor Control, Motor Learning, Posture and Balance across the Life Span
Debbie E. Thorpe (46) Pediatrics, Motor Learning, Developmental Disabilities, Aquatics
Bing Yu (43) Biomechanics, Rehabilitation, Movement Analysis

Clinical Associate Professors
Diane Lindsey (34) Consultant to State Department of Public Instruction, School and Community Programs, Pediatrics
Marie A. Reilly (35) Early Human Behavior and Development, Behavioral Motor Control, Developmental Disabilities
Cherie Rosemond (41) Geriatrics, Exercise Physiology, Clinical Orthopedics
Darlene K. Sekerač (50) Pediatrics, Health Policy, Research Utilization
Judy A. White (36) Musculoskeletal Rehabilitation, Clinical Practice/Administration

Clinical Assistant Professors
Jyotsna Gupta (50) Orthopedics, Anatomy, Neuroanatomy
Jonathan D. Hacke (42) Electrotherapy, Sports Medicine, Spinal Orthopedics, Manual Techniques
Lisa B. Johnson (49) Clinical Education
Karen L. McCulloch (39) Clinical Education, Adult Neurologic Dysfunction, Neuromuscular Rehabilitation
Thelma J. Mielenz (44) Orthopedics, Epidemiology

Instructor
Angela M. Rosenberg (47) Pediatrics, Developmental Disabilities, Recreation Outcomes

Professors Emeriti
Marjory Wilson Johnson
Ruth U. Mitchell
Margaret L. Moore
Charlene M. Nelson
Mabel M. Parker
Charles P. Schuch
Joyce W. Spaulding

The Division of Physical Therapy of the Department of Allied Health Sciences offers two graduate programs. The Master of Science program (MS) in Human Movement Science is designed for physical therapists and graduates in related fields who desire advanced knowledge in the scientific study of human movement. The Master of Physical Therapy program (MPT) offers a professional degree in Physical Therapy. This program is designed for the person with an undergraduate degree in a field other than physical therapy.

Master of Science in Human Movement

Program Description
The Master of Science program in Human Movement (MS) is designed for physical therapists and graduates in related fields who desire advanced knowledge in the scientific study of human movement. Graduates may apply this knowledge to develop a clinical specialty, participate in research, teach in entry-level degree programs, or prepare for doctoral education. The goal is to offer a challenging learning experience that emphasizes the integration of contemporary scientific knowledge to improve clinical practice, and the generation of new knowledge about movement in people with or at risk for disability. The program is organized into two major tracks, neuromuscular and musculoskeletal. Specific areas of faculty expertise and research include aging, biomechanics, motor development, motor control, motor-learning, and sports physical therapy.

Program Requirements
The Master of Science program requires satisfactory completion of thirty-six credit hours. The core requirements include fifteen credit hours of foundation courses: HMSC 200A and B-Scientific Basis of Human Motion (6 credits); HMSC 393-Master’s Thesis (6 credits); and in addition to the statistics course required for admission, either a research design course or a second-level statistics course (3 credits). Students are also required to take nine credits in a major track, at least nine credits in a supporting area, and five credits in elective courses. A written comprehensive examination and an oral defense of the thesis are required.

Musculoskeletal Track
The musculoskeletal track is designed for students who have a special interest in biomechanical and kinesiological aspects of human motion and the effects of trauma and disease on joint function. Students may choose to concentrate on the developmental aspects of musculoskeletal function in relation to congenital or early childhood disorders, adult orthopedic problems, or the aging process. Upon completion of the curriculum, students are expected to have advanced knowledge of the musculoskeletal system, to be able to apply mechanical principles to the function of the musculoskeletal system, and to be able to assess and measure normal and abnormal movement related to the musculoskeletal system.

Neuromuscular Track
The neuromuscular track is designed for students who have a special interest in neuroscience and motor control/learning. Students may choose to concentrate on the developmental aspects of normal and abnormal movement, the problems of trauma and disease affecting the adult’s neuromuscular system, or the problems of aging. Upon completion of the curriculum, the students will be able to describe theories of normal and abnormal neuromuscular function, to describe normal and abnormal function, and to utilize methods of assessing and measuring human motion.

Course Descriptions
Courses listed in HMSC are available to graduate students enrolled in other areas of the University.

HMSC 170 ELECTRONICS FOR MOVEMENT ANALYSIS RESEARCH (1). Prerequisite, permission of the instructor. Designed to provide students with basic concepts/experience with electronic laboratory equipment and basic skills for constructing simple circuits, using measurement instruments for kinematic, kinesthetic, and EMG analysis of human movement. Two laboratory hours a week. Fall, Staff.

HMSC 200A SCIENTIFIC BASIS OF HUMAN MOTION PART I (3). Prerequisites, basic kinesiology or equivalent, psychology or sociology or equivalent, and permission of instructor. Provides basic knowledge of biomechanics and exercise physiology necessary for understanding the basis of movement control and performance. Fall, Gross, Hackney.

HMSC 200B SCIENTIFIC BASIS OF HUMAN MOTION PART II (3). Prerequisites, basic kinesiology or equivalent, psychology or sociology or equivalent, and permission of instructor. Provides basic knowledge of neural, behavioral (motor control and motor learning), and environmental factors for understanding the basis of human movement control and performance. Spring, Mercer, Giuliani.

HMSC 210 MUSCLE MECHANICS AND ELECTROMYOGRAPHIC KINESIOLOGY (4). Prerequisites, HMSC 200 or equivalent and permission of the instructor. Essential elements of instrumentation and analysis of EMG for the study of human movement. Emphasis is on the integrated study of electrical and dynamic properties of muscle action. Four lecture/discussion/laboratory hours a week. Fall, Staff.

HMSC 243 TOPICS IN MOTOR CONTROL AND MOTOR LEARNING: THERAPEUTIC IMPLICATIONS (3). Prerequisites, HMSC 200 or equivalent recommended and permission of the instructor. A survey of current motor control/learning principles. Major focus is on the mechanisms underlying various movement disorders, methods used to quantify changes in movement behavior, and rationale for specific treatment interventions. Spring, Mercer.

HMSC 280 A INTRODUCTION TO OUTCOMES RESEARCH IN HEALTH CARE (3). Prerequisite, permission of the instructor. Overview of common theories and methods used in outcomes research in health care, with particular attention given to medical rehabilitation practice and patient level measures of outcomes. Spring, Fieburg.
HMSC 282 INFANT AND FAMILY ASSESSMENT (2-3). Prerequisites, HMSC 280 or equivalent and permission of the instructor. Theory and use of research and clinical methods for assessment of developmental processes in young infants and their families. Two lecture and two laboratory hours a week. Summer I. Reilly.

HMSC 282L LABORATORY IN INFANT AND FAMILY ASSESSMENT (1-3). Prerequisites, HMSC 282 or equivalent, and permission of the instructor. Training in the use of neonatal and infant assessment tools, and methods of family assessment. Two to six laboratory hours a week. Fall, spring, summer II. Reilly.

HMSC 290 ADVANCED KINESIOLOGY AND BIOMECHANICS (4). Prerequisites, HMSC 200 or equivalent and permission of the instructor. A biomechanical, problem-solving approach to the study of movement, posture, joint structure, and exercise. Four lecture hours a week. Spring. Gross.

HMSC 291 ANALYSIS OF HUMAN MOTION (3). Prerequisites, HMSC 200 or equivalent and permission of the instructor. Lecture/laboratory course with a major emphasis on using videography and electromyography analyzing human movement for the purpose of clinical documentation and research. Two lecture and two laboratory hours a week. Spring. Yu.

HMSC 293 ADVANCED ORTHOPEDIC ASSESSMENT AND TREATMENT (4). Prerequisites, HMSC 200 required, HMSC 290 recommended, permission of the instructor. Discussion of mechanical properties and healing of musculoskeletal tissues throughout the life cycle, and laboratory/seminar units concerned with assessment and treatment of musculoskeletal pathology. Four lecture/laboratory hours a week. Fall, Gross.

HMSC 301 SEMINAR IN HUMAN MOVEMENT SCIENCE (1-3). Prerequisite, permission of the instructor. In-depth reading, presentation, and discussion of selected topics related to physical therapy. Time to be arranged. Fall, spring, and summer. Staff.

HMSC 303 PROBLEMS IN HUMAN MOVEMENT SCIENCE (2-3). Prerequisite, permission of the instructor. Advanced level of applied or practical study in human movement for individuals or groups. Time to be arranged. Fall, spring, and summer. Staff.

HMSC 307 ADVANCED CLINICAL PRACTICUM IN HUMAN MOVEMENT SCIENCE (1-3). Prerequisite, permission of the instructor. Individualized clinical experience in terms of the students' prior clinical practice, special interests, and future professional plans. Six laboratory hours per week, on request. Staff.

HMSC 311 (MED 486, DECO 486) BASIC ASPECTS OF AGING (1-3). Prerequisite, permission of the instructor. Lecture series providing a comprehensive, multi-disciplinary perspective on many aspects of aging, e.g., diseases, syndromes, and their treatments; health maintenance; prevention; as well as social, economic, legal, and ethical concerns. One lecture hour a week, optional projects. Fall and spring. Williams.

HMSC 377 INDEPENDENT STUDY IN HUMAN MOVEMENT SCIENCE (1-3). Prerequisite, permission of the instructor. The student explores areas of special interest pertinent to eventual goals in human movement. Time to be arranged. Fall, spring, and summer. Staff.

HMSC 379 RESEARCH IN HUMAN MOVEMENT SCIENCE (2-4). Prerequisites, HMSC 200 and permission of the instructor. Independent investigation under the guidance of an instructor, who must approve the topic of research. Time to be arranged. Fall, spring, and summer. Staff.

HMSC 381 THE NEURAL BASIS OF MOTOR CONTROL (3). Prerequisites, Neuroanatomy, HMSC 200 or equivalent, and permission of the instructor. Advanced study of the neurophysiological basis of motor control, including development and aging, and methods of research. Fall. Giuliani.

HMSC 386 UNDERSTANDING RESEARCH (3). Prerequisites or corequisites, first-level statistics course and permission of the instructor. Explanation of the framework necessary to do and understand research with emphasis on hypothesis testing, measurement, design, interpretation, and research application. Fall. Yu.

HMSC 387 DEVELOPMENTAL MOTOR CONTROL (1-3). Prerequisite, permission of the instructor. Seminar in selected topics related to motor control in children and adults. Time to be arranged. Fall, spring, or summer. Giuliani.

HMSC 393 MASTER'S THESIS (3-6). Fall, spring, or summer. Staff.


HMSC 607 AGING AND PUBLIC POLICY (3). Interdisciplinary seminar providing a general background in the major economic, health, and social policy issues facing the nation and the state resulting from the aging of our society. Spring. Lamb, Altfater, tikin-Zimmerman.

HMSC 611 MOVEMENT AND BALANCE IN AGING (3). Prerequisite, permission of the instructor. Interdisciplinary seminar on changes in aging associated with balance, movement abilities, and disabilities. Current theories, measurements, and evidences of change in skeletal, neuromuscular, cognitive, and physiological processes are explored using a systems approach. Spring. Giuliani.

Master of Physical Therapy

Requirements for Admission

- A bachelor's degree and graduation from an accredited college or university.
- Courses equivalent to the following are required for admission into the physical therapy program (All prerequisite courses must be completed by the end of the fall semester that precedes enrollment in the program):
  - Statistics: Basic Concepts of Statistics and Data Analysis
  - Principles of Biology with Lab
  - Anatomy: General Physics I and II with Lab
  - General Chemistry I with Lab
  - General Psychology, Physiology, and Human Growth and Development.
- A four-semester-hour course in Anatomy/Physiology will satisfy the requirement for Anatomy and Physiology.
- Submission of scores of the Graduate Record Exam (GRE).
- Three letters of recommendation.
- Exposure to the profession of physical therapy.

Program Description

The master's degree in Physical Therapy (MPT) program is designed for the person with an undergraduate degree in a field other than physical therapy. The program entails two years of full-time study including summers and is limited to forty students per class.

Course Descriptions

PHYT 201 MOTOR DEVELOPMENT AND HUMAN MOVEMENT ACROSS THE LIFE SPAN (2). Overview of the multiple systems responsible for development and movement. Fall first year. Thorpe.

PHYT 205 MANAGING CONTEMPORARY PRACTICE (3). Management strategies and skills (reimbursement, budgeting, human resources, quality assessments, organization structures and marketing) for contemporary physical therapy practice. Fall second year. White.

PHYT 210 CARDIOPULMONARY AND OTHER SYSTEMS: PHYSICAL THERAPY INTERVENTION (3). A study of normal and abnormal function of the circulatory, respiratory, reproductive, and integumentary systems; includes the management of psychiatric patients/clients being treated for other physical pathologies. Summer first year. Howes.

PHYT 220 INTRODUCTION TO PHYSICAL THERAPY INTERVENTION (4). This course is the first course in a series of physical therapy procedural courses.
An overview of basic skills for patient/client examination and management. Emphasis on the physical and physiological bases of basic techniques and safety. Fall first year. Zabolitzki.

PHYT 222 SELECTED PHYSICAL THERAPY MODALITIES THEORY AND APPLICATIONS (3). Physiological effects of light, heat, cold, ultrasound, high and low frequency currents, and water as they relate to the treatment of indicated pathological conditions. Spring first year. Hacke.

PHYT 224 FUNCTIONAL ASSESSMENT (1). The objective measurement of function across the life span and disease conditions in the context of health outcomes. Patient-reported and clinician-reported outcomes using a model of disability as a conceptual foundation. Spring first year. Mielke.

PHYT 226 EXERCISE PRESCRIPTION (1). Application of principles of exercise and physiology to the design and evaluation of intervention for healthy individuals and for persons or groups with special needs or functional impairments. Summer first year. Witt.


PHYT 232 MUSCULOSKELETAL I: PHYSICAL THERAPY INTERVENTION (3). Basic concepts of the embryology, arthrology, pathology, and tissue response/healing of the musculoskeletal system; principles of examination, evaluation, and interventions; dysfunctions of shoulder, spine, pelvis, and rheumatology problems are addressed. Spring first year. White.


PHYT 235 CONSULTATIVE AND INDUSTRIAL PHYSICAL THERAPY (2). Basic principles of biomechanics, ergonomics, and soft tissue responses to stress. Emphasis is placed on lifting and seated tasks, workstation design, job screening, and understanding industry. Spring second year. Witt.

PHYT 236 PHYSICAL THERAPY FOR OLDER ADULTS (2). Permission of the instructor. Selected topics of concern to the physical therapist working with older adults. Spring second year. Zabolitzki.

PHYT 237 MATERNAL AND CHILD HEALTH PRACTICE (2). Permission of the instructor. The course focuses on domains of concern within family-based, interdisciplinary intervention. Spring second year. Rosenberg.

PHYT 238 SELECTED TOPICS IN PHYSICAL THERAPY (1-4). Prerequisites, permission of instructor. Small group learning activities related to selected specialty practice within physical therapy. Spring, second year. Staff.

PHYT 239 ISSUES IN HEALTH CARE DELIVERY (2). Overview of the current scope, methods, resources, activities, and trends of health maintenance and delivery are presented, including health care reform. Fall second year. Sekerkak.

PHYT 242 PATHOLOGY/PHARMACOLOGY FOR PHYSICAL THERAPY (1). Pathology and pharmacology information for the practice of physical therapy. Fall second year. Staff.

PHYT 250 PSYCHOSOCIAL ASPECTS OF DISABILITY AND ILLNESS (1). Study of behavior, social structures and beliefs, and interaction patterns to support the scientific basis of the effective interactions of physical therapists with patients. Fall first year. Witt.

PHYT 251 EVIDENCE-BASED PRACTICE I (1-3). Prerequisite, permission of the instructor. Introduction to logic of inquiry, clinical management, scientific methods, objective and subjective documentation, and analysis of patient/client outcomes and appropriate clinical research methodologies. Application of research design and application of existing research in practice and in the clinical decision-making process. Fall second year. Mielke.

PHYT 252 EVIDENCE-BASED PRACTICE II (1). Permission of the instructor. Guided Master's Project. Fall second year. Sekerkak.

PHYT 254 EVIDENCE-BASED PRACTICE II (3). This course is an extension of PHYT 252. Students conduct scholarly projects under the supervision of individual faculty members. Spring second year. Staff.

PHYT 260 CLINICAL EDUCATION I (2). Professional behavior, interview skills, delegation and supervision, teaching and learning styles, and other relevant topics prepare the students for clinical assignments. Spring first year. Johnston.

PHYT 261 CLINICAL PRACTICUM I (4). Students practice basic examination, evaluation, intervention, technical, and communicative skills under the supervision of clinical instructor(s). Summer first year. Johnston.

PHYT 264 CLINICAL PRACTICUM II (2). Students practice intermediate examination, evaluation, intervention, and communicative skills under the supervision of clinical instructor(s). Spring second year. Johnston.

PHYT 268 CLINICAL PRACTICUM III (8). Students practice advanced examination, evaluation, intervention, technical, and communicative skills under the supervision of clinical instructor(s). Summer second year. Johnston.

PHYT 270 HUMAN ANATOMY (6). This course is a detailed study of the musculoskeletal, peripheral nervous, cardiovascular, respiratory, digestive, and lymphatic systems. An overview of internal organ anatomy of the urogenital and integumentary systems is included. An emphasis will be placed on the neuroanatomical system, which includes normal movement functions as well as clinical applications to movement dysfunctions. Fall first year. Gupta.

PHYT 271 HUMAN NEUROANATOMY (3). The purpose of this course is to provide the knowledge base of neuroanatomy and neurophysiology so that the student may analyze neurologic injuries and conditions encountered in physical therapy practice. Students have the opportunity to learn neuroanatomical structures and functions via exposure to human neural tissue specimens and class lecture. Spring first year. Gupta.

PHYT 284 NEUROMUSCULAR: PHYSICAL THERAPY INTERVENTION I (4). Evaluation and intervention of physical impairments and functional limitations in adults and children with neurologic disorders. Stroke, brain injury, and cerebral palsy are used to provide examples of common patient problems. Fall second year. Mericer.

PHYT 285 NEUROMUSCULAR: PHYSICAL THERAPY INTERVENTION II (3). This course provides the student with the theoretical, physiological, pathologic, and behavioral basis for understanding common neuromotor dysfunctions observed in adult and pediatric physical therapy. Spring second year. McCulloch.

PHYT 299 SEMINAR IN ADVANCED CASES AND DIFFERENTIAL DIAGNOSIS (2). Students learn to screen patients/clients for pathology and identify problems within and beyond the scope of physical therapy practice and to determine appropriate interventions and referrals for complex clinical cases. Spring second year. White.

DEPARTMENT OF PHYSICS AND ASTRONOMY

BRUCE W. CARNEY, Chair

Professors
Bruce W. Carney (32) Optical Observational Astrophysics
Gerald N. Cecil (47) Optical Observational Astrophysics
Arthur E. Champagne (51) Experimental Nuclear Physics and Astrophysics
Wayne A. Christiansen (4) Theoretical Astrophysics, Radio Astronomy
Thomas B. Clegg (5) Nuclear Physics, Polarized Ion Source Development
The Department of Physics and Astronomy offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy.

The active fields of research are condensed-matter physics, microelectronics, atomic, molecular, and nuclear physics, quantum field theory, theoretical particle physics, general relativity and gravitation, stellar astronomy, and astrophysics. The Chemical Physics program combines courses from chemistry and physics with research in either department. Students can also work in the UNC Biophysics program. The graduate courses are designed to give students a broad foundation and to introduce them to the special fields in which the research interests of the department lie.

The general regulations of the Graduate School govern the work for the degrees of Master of Science and Doctor of Philosophy. To begin a graduate program in physics or astrophysics, the student should have completed the requirements for the degree of Bachelor of Science with a major in physics at the University, or their equivalent elsewhere. The minimum prerequisite for graduate study consists of the basic undergraduate courses Physics 26, 27, 28, 28L; 103, 104, 105, 106, 107, 108; together with Mathematics 32, 33, and 124. In the first spring as a graduate student in physics at UNC a student who does not already have a master's degree in physics or astronomy and has not passed a similar examination elsewhere must take the qualifying examination; this exam covers the content of first-year course work. This examination serves as a comprehensive examination for the M.S. degree and/or as a qualifying examination for the Ph.D. degree. A Ph.D. candidate must also take a Ph.D. written examination and a preliminary doctoral oral examination within the first three years of graduate study in physics at UNC. The written examination is based upon the graduate student's course work, and the oral examination is concerned mainly with the student's dissertation research project.

The M.S. degree in physics may be taken with or without thesis. However, even if a thesis is not submitted, a student must work with a research group for at least one semester, in order to learn the research techniques in a field of physics or astronomy. If the research is theoretical, the student must also gain experimental experience. A minor is not required for the M.S. degree, but one may be chosen in accord with the regular graduate requirements for this option. The equivalent of one semester teaching experience is required of all M.S. degree candidates. The M.S. astrophysics track must include ASTR 244 and a minimum of six hours from ASTR 137, 242, 243, or 245.

The requirements for a Ph.D. in physics for students entering in 2001 are: (a) A student must pass the following courses in the department, or have passed their equivalents elsewhere as an undergraduate or graduate student: 203, 204-205, 221, and 260-261; (b) in order to acquire some familiarity with experimental physics, a student must pass one semester of the Advanced Laboratory, Physics 201-202; or earn an M.S. degree which involves experimental research, whether or not a thesis is written; or perform other experimental research judged adequate by the director of Graduate Studies; (c) a student must take a course outside his or her field of specialization from a list approved by the director of Graduate Studies; and (d) a student must pass at least three other graduate-level courses appropriate to his or her field of specialization. A minor is not required, but
Research Interests

Astronomy and Astrophysics. Research includes structure and evolution of stars, galaxies, and quasars. Observations are carried out using national and international observatories and spacecraft. Data analysis and modeling are carried out using Morehead Observatory Sun workstations and University computers and supercomputers. A new technology 4-meter telescope is being constructed in Chile.

Atomic, Molecular, and Chemical Physics. Theoretical and experimental areas include magnetic resonance and relaxation, properties of solids and surfaces, excited states of molecules, and charge transport in solids and fluids. The chemical physics program involves collaboration with the Department of Chemistry.

Condensed-Matter Physics. Research activities include experimental and theoretical studies of superconductors, fullerenes, amorphous materials, superconductors, the optical properties of solids, molecular properties at solid surfaces, lattice dynamics, and the mechanism of photochemistry. Among the techniques employed are ion implantation and ion beam analysis, NMR and EPR, Mössbauer spectroscopy, STM and AFM, and Raman spectroscopy.

Field Theory, Particle Physics, Gravitation, and Relativity. Research includes gauge field theories, quantum chromodynamics, electroweak theory, grand unified theories, string theory, supersymmetry, supergravity, Cauchy problem of general relativity, gravitational radiation, and the classical and quantum structure of gravitational fields.

Nuclear Physics. Experimental nuclear physics is carried out using spin-polarized protons, neutrons and deuterons. Experimental and theoretical research emphasizes using polarized beams in nuclear interaction studies and fundamental symmetries in nuclei. The Nuclear Astrophysics Program focuses on aspects of stellar evolution that can be examined by nuclear probes.

Facilities and Equipment

Research in physics and astronomy is carried out in several laboratory facilities. In Phillips Hall, where the department's offices are located, are research laboratories used mainly for atomic, molecular, and condensed-matter physics research. Equipment includes spectrometers covering X-rays to microwaves, an electron microscope, NMR, AFM and STM, and ESR systems, Mössbauer, Raman, and optical absorption spectrometers, high-pressure apparatus, lasers, cryogenic equipment, an intense gamma-ray source, crystal growth facilities, a 500keV ion implantation machine, and a 2-MeV Van de Graaff accelerator. Nuclear physics research is carried out at UNC and at Triangle Universities Nuclear Laboratory (TUNL) in Durham, a facility with two Van de Graaff accelerators and a low energy astrophysics laboratory, operated in collaboration with Duke University and North Carolina State University.

Computing facilities include many microcomputers, seven SUN workstations and one microVAX workstation in Phillips Hall, two SUN workstations in Morehead Observatory, and a dozen workstations at TUNL. Also available are an IBM 3090 and a Convex C240 on campus and a Cray Y-MP at the NC Supercomputing Center in Research Triangle Park.

Library facilities include the Alfred T. Brauer Library (mathematics, physics, statistics, computer science, and operations research) in Phillips Hall, which has 60,000 volumes and subscriptions to 200 physics and astronomy journals, and access to seventeen other libraries on the Chapel Hill campus having a total of over 4.6 million volumes.

Fellowships and Assistantships

Many teaching assistantships (with stipends of $12,285 for nine months) are available to qualified graduate students. The duties of assistants include supervising laboratory classes in elementary physics or astronomy, assisting in the supervision of advanced laboratories, teaching recitation sections, and grading papers. Graduate School fellowships, including a microelectronics fellowship for first-year students, are available for well-qualified applicants to the department's graduate program. Teaching assistants can usually be supported in the summer by teaching or research.

Research assistantships are also offered, especially to those who have completed a year or two of graduate work. The stipend is $16,380 for the calendar year. Summer employment is usually available.

Application forms for admission, including graduate appointments, may be obtained from the web at www.physics.unc.edu or from the Graduate Admissions Committee, Department of Physics and Astronomy, CB# 3255, Phillips Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3255. Application for fall admission should be made by January 1.

Courses for Graduates and Advanced Undergraduates

* Astronomy 117 is not to be taken for graduate credit by graduate students in physics and astronomy.

Astronomy

117* COSMIC EVOLUTION (3). Prerequisites, Mathematics 32 and Astronomy 31 (or permission of the instructor). A course in stellar and galactic structure and evolution with emphasis on astronomical conditions for the development of astronomical objects. Fall or spring. (Alternate years.) Rose, staff.

137 OBSERVATIONAL ASTRONOMY (4). Prerequisite, Astronomy 31 or permission of the instructor. A course designed to familiarize the student with observational techniques in optical and radio astronomy, including application of photography, spectroscopy, photometry, and radio methods. Three lecture and three laboratory hours a week. Fall or spring. (Alternate years.) Rose, staff. (Laboratory fee required.)

142 ASTROPHYSICS I (Stellar Astrophysics) (3). Prerequisites, PHYS 28, MATH 83, or permission of the instructor. An introduction to the study of stellar structure and evolution. Topics covered include observational techniques, stellar structure and energy transport, nuclear energy sources, evolution of the main-sequence, and supernovae. Fall. Carney, Christiansen, Rose.

143 ASTROPHYSICS II (Interstellar Matter and Galaxies) (3). Prerequisites, PHYS 28, Math 83, or permission of the instructor. An introduction to the study of the structure and contents of galaxies. Topics covered include the interstellar medium, interstellar hydrodynamics, supersonic flow and shock formation, star formation, galactic evolution, the expanding universe, and cosmology. Spring. Carney, Christiansen, Rose.

243 GALACTIC DYNAMICS AND PHYSICAL PROCESSES IN THE INTERSTELLAR MEDIUM (3). Prerequisites, Physics 260, Physics 203. Collisionless and collisional stellar dynamics; disk dynamics and spiral structure; encounters between stellar systems. Physical processes in diffuse gases, HII regions, and supernova remnants: ionization and energy balance of the interstellar medium; star formation. Fall. Rose.

244 PHYSICAL PROCESSES IN STELLAR ATMOSPHERES AND INTERIORS (3). Prerequisites, Physics 260, Physics 204. Equation of transfer; continuous and line opacities; model atmospheres; spectral line formation. Equations of stellar structure; energy transport; nuclear reaction rates; modeling stellar evolution. Spring. Carney.

245 EXTRAGALACTIC ASTROPHYSICS (3). Corequisite, Physics 203. Hubble law; morphology of galaxies (mass distributions, ages, dynamics); clusters of galaxies; isotropy and voids; microwave background; large-scale structure; Robertson-Walker metric; standard cosmology; Big Bang nucleosynthesis; thermodynamics of expanding universe; inflation; formation of structure. Fall or spring. Cecily.

350 SEMINAR IN ASTROPHYSICS (1 or more). Recent observational and theoretical developments in stellar, galactic, and extragalactic astrophysics. Fall and spring. Staff.

Physics 1 Physics 103-104 and 107-115 are not to be taken for graduate credits by graduate students in physics.

101 ELECTRONICS I (3). Prerequisites, introductory physics and Mathematics 31, or permission of the instructor. DC and AC circuit analysis, PN junctions and diodes, single-transistor circuits, transistors, analog devices. Extensive circuit building with testing, trouble shooting, and debugging. Three lecture and three laboratory hours a week. Fall. Karwowski.


1031 MECHANICS I (3). Prerequisites, Physics 27 or permission of the instructor) and Mathematics 33. Particle kinematics, central forces, planetary motions. Systems of particles, conservation laws, nonlinearity. Statics, motion of rigid bodies. Langrange's and Hamilton's equations, Euler's equations. Vibrations and waves. Spring. Washburn, staff.

1041 MECHANICS II (3). Prerequisite, Physics 103. Advanced topics in mechanics. Fall. Staff.

105 HEAT AND THERMODYNAMICS (3). Prerequisites, Physics 27 (or 25 or 25c by permission of the instructor) and Mathematics 33. Equilibrium statistical mechanics; the thermodynamics laws, internal energy, enthalpy, entropy, thermodynamic potentials. Maxwell equations. Fall. Wu.


107, 108 ELECTRICITY AND MAGNETISM (3 each). Prerequisites, Physics 27 and Mathematics 34 (or permission of the instructor). Brief treatment of DC and AC circuit theory. Electrostatics: dielectrics; the magnetic field; magnetic materials. Maxwell's equations and their application to electromagnetic waves. Fall and spring. Hernandez.

1131 SPACE AND TIME IN PHYSICS AND PHILOSOPHY (Philosophy 121) (3). Contingent and necessary properties of space and time. The direction and flow of time. Paradoxes preceding their causes. Spring. Van Dam, staff.

1151 THE EVOLUTION OF PHYSICAL IDEAS IN THE TWENTIETH CENTURY (3). Prerequisites, Physics 25 and Mathematics 30 (or permission of the instructor). The most important physical ideas and phenomena, discovered in the twentieth century, are studied by reading original papers or excerpts (in translation). These works are put in historical perspective. Spring. Staff.

134 VISUALIZATION IN THE SCIENCES (Materials Science 134, Computer Science 134) (3). For both computer science and natural science students. Available techniques and their characteristics, based on human perception, using software visualization toolkits. Project course.

140 PHYSICS OF SOLID STATE ELECTRONIC DEVICES (3). Prerequisite, Physics 25C or 27. Corequisite or prerequisite, Physics 58 or 107. Properties of crystal lattices, electrons in energy bands, behavior of majority and minority charge carriers, p-n junctions related to the structure and function of semiconductor diodes, transistors, display devices. Fall. McNell.

141 ELECTRONICS (4). Prerequisites, Physics 27 (or 58), Mathematics 34. Basic electronics with emphasis on circuitry. DC and AC circuits, diodes and application, transistors, amplifiers, wave form generators, operational amplifiers, digital electronics, transmission lines. Physics 101 and 141 may not both be taken for credit. Three lecture and three laboratory hours a week. Spring. Tsuhi.

142L, 143L ADVANCED LABORATORY I AND II (2 each). Prerequisite, Physics 101 or 102 or permission of the instructor. Selected experiments illustrating modern techniques such as the use of laser technology to study the interaction of electromagnetic fields and matter. Six laboratory hours a week. Fall and spring. McNell.

144 CHEMISTRY AND PHYSICS OF ELECTRONIC MATERIALS PROCESSING (Chemistry 192) (3). Prerequisites, Chemistry 182 or Physics 25C or 27 and permission of the instructor. A survey of materials processing and characterization used in fabricating microelectronic devices. Crystal growth, thin film deposition and etching, and micro lithography. Spring. Zhou.


149L MATERIALS LABORATORY II (Applied Science 145L) (2). Prerequisite, Physics 148L or Applied Science 144L. Continuation of Physics 148L with emphasis on low- and high-temperature behavior, the physical and chemical behavior of lattice imperfections and amorphous materials, and the nature of radiation damage. Spring. Panik.

151 FLUID DYNAMICS (Marine Sciences 151) (Geology 181) (3). Prerequisite, Physics 103 or permission of the instructor. The physical properties of fluids, kinematics, governing equations, viscous incompressible flow, vortex dynamics, boundary layers, irrotational incompressible flow. Fall. Bane.


161 NUCLEAR PHYSICS (3). Prerequisite, Physics 160 or equivalent. Structure of the nucleus, symmetries, nuclear forces, nuclear structure and reactions, weak interactions, and physics beyond the standard model. Spring. Champagne.

163 APPLICATION OF QUANTUM MECHANICS (3). Prerequisite, Physics 160. Emphasizes atomic physics but includes topics from nuclear, solid state and
particle physics, such as energy levels, the periodic system, selection rules, and fundamentals of spectroscopy. Fall. Hubbard.


169 INTRODUCTORY SOLID STATE PHYSICS (3). Prerequisite. Physics 160 or equivalent. Crystal symmetry, atomic structure of crystalline and non-crystalline solids, and imperfections in crystals; atomic bonding and types of atomic bonds in solids; electron and mechanical waves in solids; thermal, electrical, optical, and magnetic properties of solids; electronic structure and superconductivity of solids. Fall. Hernandez.

181, 182 ADVANCED LABORATORY (3 each). Prerequisite. Physics 103, 108, or permission of the instructor. Six laboratory hours a week. Fall and spring. McNeil.


193 SCIENTIFIC PROGRAMMING (3). Prerequisites. Mathematics 128 or 129, or Physics 191 or 192; elementary FORTRAN, C, or Pascal programming. Structured programming in FORTRAN or Pascal; use of secondary storage and program packages; numerical methods for advanced problems, error propagation and computational efficiency; symbolic mathematics by computer. Spring. Thompson.

Courses for Graduates

* The Physics 262 and Physics 380 sequence alternates with Physics 263-264.

201, 202 ADVANCED SPECTROSCOPIC TECHNIQUES (3 each). Prerequisite. Physics 103, 108, or permission of the instructor. Advanced spectroscopic techniques, including Rutherford backscattering-channeling, perturbed angular correlation, Raman scattering, electron paramagnetic resonance, nuclear magnetic resonance, optical absorption and Hall effect. 201 (fall) has two hours of lecture and three hours of laboratory a week, and 202 (spring) has one hour of lecture and five hours of laboratory a week. McNeil.


205 ELECTROMAGNETIC THEORY II (3). Prerequisite. Physics 204 or equivalent. Plane electromagnetic waves and wave propagation, wave guides and resonant cavities, simple radiating systems, scattering and diffraction, special theory of relativity, radiation by moving charges. Fall. Evans.


262 ADVANCED QUANTUM MECHANICS (3). Prerequisite. Physics 261. Advanced angular momentum, atomic and molecular theory, many-body theory, quantum field theory. Fall. (Alternate years.) Dolan.

263, 264* FIELD THEORY (3 each). Prerequisite. Physics 261. Quantum field theory, path integrals, gauge invariance, renormalization group, Higgs mechanism, electroweak theory, quantum chromodynamics, Standard Model, unified field theories. Fall and spring. (Alternate years.) Dolan, Flanders.

267 CURRENT ADVANCES IN PHYSICS (3). Prerequisite, permission of the instructor. In recent years, elementary particle physics, amorphous solids, and high temperature superconductors have been among the topics discussed. Either semester, as announced. Staff.

270, 271 SOLID STATE PHYSICS (3 each). Prerequisite. Physics 160 or equivalent. Topics considered include those of Physics 169, but at a more advanced level, and in addition a detailed discussion of the interaction of waves (electromagnetic, elastic, and electron waves) with periodic structures; e.g., X-ray diffraction, phonons, band theory of metals and semiconductors. Fall and spring. Hernandez.


288, 289 PRINCIPLES OF CHEMICAL PHYSICS (Chemistry 288, 289) (3 each). Prerequisite. Physics 160 or Chemistry 281 or permission of the instructor. The quantum mechanics of molecules and their aggregates. Atomic orbitals, Hartree-Fock methods for atoms and molecules. Special topical interest to the instructor and research students. As announced.

290 PRINCIPLES OF MAGNETIC RESONANCE (3). Prerequisite. Physics 260, or Chemistry 281, or permission of the instructor. Either semester, as announced. Wu.


Research Courses

301 RESEARCH (3 or more). Ten or more laboratory or computation hours a week. Fall and spring. Staff.

310 SEMINAR IN THEORETICAL PHYSICS (1 or more). Topics from current theoretical research including, but not restricted to, field theory, particle physics, gravitation, and relativity. Fall and spring. York.

322 SEMINAR IN PROFESSIONAL PRACTICE (Var). Prerequisite. Ph.D. written exam passed. The role and responsibilities of a physicist in the industrial or corporate environment and as a consultant. Fall, spring, summer. Graduate faculty.
360 SEMINAR IN NUCLEAR PHYSICS (1 or more). Current research topics in low-energy nuclear physics, especially as related to the interests of Triangle Universities Nuclear Laboratory. Fall and spring. Karwowski.

364 SEMINAR IN ATOMIC AND MOLECULAR PHYSICS (1 or more). Experimental and theoretical topics in atomic collision physics, chemical physics, molecular states, and surface properties. Fall and spring. Staff.

370 SEMINAR IN SOLID STATE PHYSICS (1 or more). Research topics in condensed-matter physics, with emphasis on current experimental and theoretical studies. Fall and spring. Washburn.

380 SEMINAR IN PARTICLE PHYSICS (1 or more). Symmetries, gauge theories, asymptotic freedom, unified theories of weak and electromagnetic interactions, and recent developments in field theory. Fall and spring. Dolan.

392 MASTER'S RESEARCH PROJECT (3 or more). Either semester. Staff.

393 MASTER'S THESIS (3 or more). Either semester. Staff.

394 DOCTORAL DISSERTATION (3 or more). Either semester. Staff.

DEPARTMENT OF POLITICAL SCIENCE
JONATHAN HARTLYN, Chair

Professors
Thad Beyle (3) State and Local, Policy Studies
Pamela Conover (10) Political Psychology, Mass Political Behavior, Gender Politics
Virginia Gray (40) State Politics, Public Policy, Interest Groups
Jonathan Hartlyn (46) Comparative Politics, Latin American Politics
Evelyn Huber (54) Comparative Politics, Political Economy, Latin American Politics
Michael Levine (38) History of Political Thought, American Political Theory
David Lowery (45) Urban Politics, State Politics, Bureaucratic Politics
Stuart Elaine Macdonald (39) Political Behavior, Public Opinion, Research Methods
Michael MacKuen (66) American Politics, Political Methodology
Gary Marks (18) Comparative Politics, Western Europe
George Rabinowitiz (25) Elections, Political Parties, Statistical Methods
Lars Schoultz (20) U.S.-Latin American Relations
Donald Seager (30) Comparative Politics, Political Psychology
Jurg Steinre (31) Comparative Politics, Ethics in Politics
John Stephens (55) Political Economy, Western Europe, Caribbean
James Simons (69) American Politics, Political Methodology
James White (34) Comparative Politics, Urban Politics, East Asia-Japanese Politics

Associate Professors
Susan Bickford (58) History of Political Thought, Feminist Theory, Democratic Theory
Liesbet Hooghe (04) Comparative Politics, European Union, West European Politics
Michele Hoyman (06) American Politics, Public Administration, Labor Relations and Labor Law, Rural Economic Development
Stephen Leonard (15) History of Political Thought, Philosophy of Social and Political Inquiry, Republicanism, History of the Academic Disciplines
Kevin McGuire (60) Judicial Politics, American Politics
Timothy McKeown (22) International Relations, International Political Economy
Catharine Newbury (24) Comparative Politics, African Politics, Gender and Development
Thomas Oatley (57) International Relations, International Political Economy, European Countries
Jeffrey Obler (23) Political Theory and Public Policy
Marco Steenbergen (61) Political Psychology, Public Opinion, Voting Behavior, Quantitative Methods
Terry Sullivan (47) Congressional and Executive Politics

Assistant Professors
Stephen Biddle (64) International Relations, Security Studies, Defense Policy
Mark Crescenzi (08) International Politics, Conflict Processes, Political Economy

Norman Hurley (63) American Politics, Mass Political Behavior, Political Psychology, Public Opinion, Race and Politics
Andrew Reynolds (13) Comparative Politics, Political Institutions, African Politics
Michaell Ting (11) American Politics, Formal Theory, Elections, Organizations, Business and Public Policy
Isaac Utz (62) Judicial Politics, Regulatory Policy, Bureaucratic Implementation
Milena Vachudova (12) Comparative Politics, International Institutions, Western and Eastern European Politics

Professors Emeriti
Raymond Dawson
Lewis Lipset
Duncan MacRae
Richard Richardson
Robert Rupen
Joel Schwartz
Andrew Scott
Glen Snyder
Deil Wright

The Department of Political Science offers courses of study leading to the Master of Arts in Political Science, Master of Arts in Political Science with a certificate in Latin American Studies, and the Doctor of Philosophy in Political Science.

Admission
The general prerequisite for admission to graduate study is a Bachelor of Arts degree or equivalent. A student is not required to have an undergraduate major in political science but will normally be expected to have had at least nine semester hours of course work in political science.

All applicants for admission to graduate study must take the Graduate Record Examination. Prospective applicants should take the test early enough to enable them to submit official reports of scores with their application for admission. In considering applications for fellowship awards, these test scores receive heavy emphasis. Applicants are encouraged to have their applications complete by January 1. Applicants are also required to submit a writing sample and a personal statement.

Graduate Study in Political Science
Departmental programs of graduate study are intended to train professional political scientists. Thus graduate work is expected to be qualitatively different from undergraduate work. Its emphasis is upon the acquisition of tools, skills, and knowledge at a level to qualify the student to carry on research, to teach, to fill active political and administrative duties, and other roles to carry on the profession of practicing political scientists.

All candidates for graduate degrees will be expected to achieve broad mastery at the professional level of the literature, problems, and skills of the academic fields and subfields offered for the degree, and will have gained experience in teaching and research. Much more is required of the candidate than mere compilation of credits in relevant courses.

At the M.A. level, the student is required, in addition to passing the course programs successfully, to write a thesis and to be examined orally on the major field of interest and in defense of the thesis.

At the doctoral level, preliminary examinations are both written and oral, in that order. Written examinations are given twice each year, in September and in the spring semester. The final part of the examination is an oral defense of the dissertation proposal. Successful completion of these examinations permits a student to become a doctoral candidate. Following completion of the dissertation, a final oral examination will be held, which is primarily a defense of the dissertation but may include such excursions into underlying theory and related fields as are germane to the dissertation.
Field and Course Requirements

The political science curriculum is designed to ensure that graduate students develop a professional competence in the discipline as a whole as well as expertise in one major and one minor field. The courses in the department are grouped under the following broad categories: International Relations, Comparative Politics, Political Philosophy, American Politics, Methodology, and Public Policy/Public Administration (minor field only).

Ph.D. students are required to demonstrate competence in two fields of study and, by participating in the instructional program, to undergo training as teachers. A minimum of four courses and a comprehensive examination is required in the major field. A comprehensive examination and three courses are required in the minor field.

The Institute of Latin American Studies and the Graduate Certificate

The Institute of Latin American Studies and the Consortium in Latin American Studies at UNC-Chapel Hill and Duke University serve as a medium for interdisciplinary communication on Latin America, encouraging and stimulating instruction and research on the region. They provide funding for interdisciplinary working groups, visiting scholars, research workshops, and guest lectures, as well as support for graduate students through academic year and summer fellowships, and research and conference travel grants. The program has been funded as a National Resource (Title VI) Center since 1991 by the U.S. Department of Education.

Although the University of North Carolina at Chapel Hill does not grant an interdisciplinary postgraduate degree in Latin American Studies, graduate students seeking to document their area expertise are encouraged to earn a Certificate in Latin American Studies in conjunction with an advanced degree in any University graduate program. The requirements for the certificate are 1) a minimum of two semesters of residence, 2) language competence in Spanish or Portuguese, 3) four graduate courses on Latin American topics, and 4) an oral defense of the thesis. For students in professional schools or departments that do not require defense of a thesis, a letter from the student’s adviser indicating that a major research project on a Latin American topic was successfully completed will be sufficient to waive the requirement. Graduate students interested in obtaining a Certificate in Latin American Studies should contact the director of the Institute of Latin American Studies.

The Center for European Studies

The Center for European Studies provides a focus for interdisciplinary and political research by funding research seminars, guest lectures, conferences, and graduate student summer and academic year fellowships. In recent years the center has hosted international conferences on the European Union, regional regimes, and the political economy of capitalist democracies. Graduate students have been closely involved in these conferences. The center has established a TransAtlantic Masters Degree program in consortium with eight European and American universities. CES is funded as a National Resource Center by the United States Department of Education and as a European Union Center by the EU.

Center for Slavic, Eurasian, and East European Studies

The Center for Slavic, Eurasian, and East European Studies (CSEEES) is an interdisciplinary center run jointly with a sister center at Duke University. In addition to offering an undergraduate major in Russian and East European Studies, the center actively promotes graduate education and research in this area of the world.

As a United States Department of Education Title VI Center, CSEEES awards Foreign Language and Area Studies (FLAS) fellowships to a few graduate students each academic year and summer to help them acquire the language skills and area expertise necessary for advanced study and field research in this part of the world.

The Louis Harris Data Center

National pollsters Harris Interactive (formerly Louis Harris & Associates) has been surveying Americans’ opinions on issues of national importance since the late 1950s. Harris surveys cover many topics, including national morale, the arts, energy policy, women’s roles, political candidates, violence, health, and housing. The breadth and scope of the Harris surveys make them a rich source for secondary analysis by social scientists.

In 1965, Louis Harris agreed to make his data available for secondary analysis by researchers. Harris and the University of North Carolina jointly agreed to establish at Chapel Hill the Louis Harris Data Center as the national archive for all Harris data. Since 1965, over two hundred national, state, and community studies conducted by Harris Interactive have been deposited at the Harris Data Center for use by researchers at the University and elsewhere.

Publications

The James Sprunt Studies in History and Political Science, established by the late Dr. James Sprunt, of Wilmington, North Carolina, is published under the direction of the departments involved.

Courses for Graduates and Advanced Undergraduates

102 RESEARCH IN URBAN POLITICS (3). Prerequisites, Political Science 41 and either Political Science 42 or 43. Examines contemporary research programs on urban politics conducted by political scientists. These topics will be examined in terms of substantive findings and research methodology. Fall. Spring.

114 COMPARATIVE EUROPEAN SOCIETIES (SOCI 118) (3). Examination of commonalities and differences of European societies and of the tensions and difficulties attending the European integration process. Fall. Nielsen, Marks.

115 POLITICS OF THE EUROPEAN COMMUNITY (3). Prerequisite, Political Science 52 or instructor’s permission. Examines the politics and political economy of institutional change and policy making in the European Community. Fall. Spring. Marks, Oakley.

116 POLITICS OF MEXICO, CENTRAL AMERICA, AND THE CARIBBEAN (3). Prerequisite, Political Science 56 or permission of the instructor. The analysis of politics in Mexico, Central America, and the Caribbean. Fall or Spring. Hartlyn, Huber.

117 POLITICAL ECONOMY: THE DOMESTIC SYSTEM (3). Problems of the national government in managing capitalist development and economic growth; political constraints, patterns of conflict among domestic actors. Fall.

119 CENTRAL AFRICA: THE POLITICS OF DEVELOPMENT (AFRI 123) (3). Prerequisite, African Studies 40 or equivalent. Study of the postcolonial political economies of central African states, with emphasis on the state’s role in development, the changing character of state/society relationships (including recent pressures for democratization), and the local impact of region and global external linkages. Spring. Newbury.

120 POLITICS OF SOUTH AMERICA (3). Prerequisite, Political Science 56 or permission of the instructor. The analysis of politics in South America. Fall or Spring. Hartlyn, Huber.

121 DEMOCRACY AND INTERNATIONAL INSTITUTIONS IN AN UNDIVIDED EUROPE (3). Explores the collapse of communist rule in 1989.
and the reaction of international institutions to the challenges of democratization, economic transition, ethnic conflict, and European integration in an undivided Europe. Fall and spring. Vazhudova.

122 THE UNITED STATES AND RUSSIA (3). A comparative inquiry into contrasting cultures, values, attitudes, and behavior patterns: Why can’t and why don’t the Russians want to be like Americans? Fall. Staff.

123 GOVERNMENT AND POLITICS IN JAPAN (ASIA 123) (3). Examines the Japanese political process in the period since World War II with emphasis on popular culture and behavior, and on governmental policy making in both domestic and foreign affairs. Previous course work on East Asia recommended but not required. Spring. White.

123M RESEARCH IN JAPANESE POLITICS (3). An introduction to quantitative data analysis based on the study of Japanese public opinion, political participation, and voting behavior. Spring. White.

125 CONTEMPORARY CHINA-GOVERNMENT AND POLITICS (3). Examines the development of the political system of China with particular emphasis on its historical, social, and cultural dimensions. Fall. Staff.

126 POLITICS AND SOCIETY IN AFRICA (3). Prerequisite, Political Science 59 or 60 or African Studies 40. Comparative analysis of state-society relations in selected postcolonial African countries. Spring. Reynolds.

127 DEMOCRACY AND DEVELOPMENT IN LATIN AMERICA (3). Prerequisite, Political Science 56 or permission of the instructor. The analysis of central issues of democracy and development in Latin America. Fall or spring. Hardin, Huber.

127S DEMOCRACY AND DEVELOPMENT IN LATIN AMERICA (3). Prerequisites, Political Science 56 and Spanish 1-4 or equivalent intermediate-level language knowledge, or, by permission of the instructor. The analysis of central issues of democracy and development in Latin America. Spring. Hardin.

128 EUROPEAN POLITICS (3). Prerequisite, Political Science 52. Active participation of students in a research project on career motives and ethical principles in European countries. Fall and spring. Steiner.

129 GERMANY IN EUROPEAN POLITICS (3). Prerequisite, Political Science 52 or permission of the instructor. An examination of the role of postwar Germany in Europe; the German question and the special relationship between the two German states; comparison of the Federal Republic and the German Democratic Republic. Fall and spring. Staff.

130 SOUTHERN AFRICA IN CONFLICT (3). Prerequisite, Political Science 86 or 59 or permission of the instructor. The problems of race, class, and ideology are explored in the countries south of the Zambezi River along with the political and economic ties that bind these countries.

132 HEALTH POLITICS AND POLICY (3). An analysis of health care in the United States with selective comparisons from health care systems in other developed democratic societies. Spring. Staff.

133 POLITICS OF MACROECONOMIC POLICY (3). The effects of political considerations on macroeconomic policy making, and the effects of economic variables on voting and popular support for incumbents. Fall or spring. Staff.

134 NORTH CAROLINA POLITICS AND PUBLIC POLICY (3). An intensive study of politics, government, and public policy in the state of North Carolina. Emphasis is placed on student research projects, with a major paper being the main requirement. Fall. Beyle.

135 STATE POLITICS AND PUBLIC POLICY (3). The comparison of development and implementation of public policy in the states. Special emphasis is placed on the impact of the political process and intergovernmental relations. Spring. Staff.

136 SOUTH IN NATIONAL POLITICS (3). This course analyzes the important roles played by the South in national politics. Topics include the role of southerners in the U.S. House and U.S. Senate. Fall. Staff.

138 POWER, MORALITY, AND FOREIGN POLICY (PWAD 138) (3). Prerequisite, Political Science 86 or permission of the instructor. To what extent can, and should, moral concerns be integrated into national foreign policy? An examination of theoretical alternatives as well as selected substantive issues (e.g., human rights, just war, food policy, development assistance). Staff.

139 ALTERNATIVE APPROACHES TO PEACE AND SECURITY (PWAD 139) (3). Prerequisites, Political Science 86, History 18, or permission of the instructor. Introduces students to alternative conceptions of security, including mutual security, cooperative security, and collective security. Course assumes students have background in history, security, or international relations. Spring. Staff.

140 INTERNATIONAL POLITICAL ECONOMY (3). Prerequisites, Political Science 86 and Economics 10. Theories of international political economy; major trends in international economic relations; selected contemporary issues. McKeeown.

142 INTERNATIONAL CONFLICT PROCESSES (3). Prerequisite, Political Science 86 or permission of the instructor. Analysis of international conflict and the causal mechanisms that drive or prevent conflict. Emphasis is on the conditions and processes of conflict and cooperation between nations. Fall. Crescenzi BA-level Social Science perspective.

143 POLITICS OF THE VIETNAM WAR (3). The war on the battlefield and in the villages, as well as high level political and military decision making. Emphasis on theories applicable to other conflicts. Fall. McKeeown, Biddle, Crescenzi.

144 AMERICAN FOREIGN POLICY: FORMULATION AND CONDUCT (PWAD 144) (3). Prerequisite, Political Science 86 or permission of the instructor. This course focuses on the making of American foreign policy. It deals with the role of Congress, the press, public opinion, the President, the Secretary and the Department of State, the military, and the intelligence community. Emphasis is placed on the impact of the bureaucratic process on the content of foreign policy. Staff.

145 CONTEMPORARY INTERNATIONAL RELATIONS OF THE UNITED STATES (3). Prerequisite, Political Science 86 or permission of the instructor. A study of selected United States foreign policy problems since World War II; analysis of the process of policy formulation from Truman to Reagan; and of the impact of the international environment and domestic policies on the White House and Department of State. Staff.

146 INTERNATIONAL COMMUNICATIONS AND COMPARATIVE JOURNALISM (JOUR 146) (3). Fall, spring.

147 CONTEMPORARY INTER-AMERICAN RELATIONS (PWAD 147) (3). Prerequisite, Political Science 56 and/or 87. A comprehensive analysis of hemispheric international relations and foreign policies of individual Latin American nations. Spring. Schoultz.

148 THE UNITED STATES AND MEXICO (3). A comprehensive analysis of United States relations with Mexico, focusing on the origin and evolution of contemporary issues such as legal and illegal immigration, the North American Free Trade Agreement, border ecology, and drug trafficking. Fall, spring. Schoultz.

149 DEFENSE POLICY AND NATIONAL SECURITY (AERO 149) (PWAD 149) (3). Prerequisite, Political Science 86 or permission of the instructor. A study of national defense policy as affected by the constitutional and political setting, as well as its relation to foreign policy. Some attention to strategic doctrine. Biddle.

150 THEORY OF WAR (PWAD 150) (3). Examines the nature, purposes, and conduct of war. Emphasizes interaction between political and military phenomena; introduces the study of strategy and its relationship to domestic and international politics. Spring. Biddle. BA-level Social Science perspective.
151 THE ADVERSARY SYSTEM OF CRIMINAL JUSTICE (3). Focuses upon the political, legal, and administrative problems encountered in the actual operation of the American System of Criminal Justice as affected by the adversarial nature of its processes. Fall. Staff.

152 LAW ENFORCEMENT IN A DEMOCRATIC SOCIETY (3). Deals with the development and current functioning of law enforcement agencies in the United States, legal and practical issues involved in the exercise of police discretion, judicial supervision of law enforcement activities, policy community relations, the impact of technological change and research on law enforcement, contemporary practices and future possibilities respecting functional improvements on law enforcement. Fall. Staff.

153 CONSTITUTIONAL POLITICS AND THE JUDICIAL PROCESS (PWAD 153) (3). Analysis of the structure and functions of judicial systems emphasizing the organization, administration and politics of judicial bureaucracies and roles of judges, juries, counsel, litigants, and interest groups in adjudication process. Fall. Unah, McGuire.

154 MOCK CONSTITUTIONAL CONVENTION (3). Students employ their understanding of political philosophy and practical politics to write a new constitution for the United States. Emphasis is on creative blending theory and practice. MacKuen.

155 THE CONSTITUTION OF THE UNITED STATES (History 175) (3). A study of the fundamental principles of constitutional interpretation and practice in the United States utilizing lectures, textbooks, and cases. Emphasis is on the political context surrounding the impact following Supreme Court decisions. Fall. McGuire.

156 JUNIOR/SENIOR SEMINAR IN POLITICS AND LAW (3). Advanced topics of varying focus, taught in seminar format for students who have completed appropriate background course work. Permission of the instructor is required. Spring. Unah, McGuire.

157 CIVIL LIBERTIES UNDER THE CONSTITUTION (3). An analysis of the complex problems created by the expansion of protections for individual liberties in the United States. Emphasis is on contemporary problems with some supplement involved in effecting changes in correctional administration. Spring. Unah, McGuire.

158 THE PROBLEMS OF CHANGE IN CORRECTIONAL ADMINISTRATION (3). Analysis of the political, legal, and administrative problems involved in effecting changes in correctional administration. Spring. Staff.

159 CRIMINAL LAW - DEVELOPMENT AND ADMINISTRATION (3). Analysis of problems in defining, invoking, and administering criminal law as a governmental process. Spring. Staff.

161 SOCIAL AND POLITICAL PHILOSOPHY (3). A study of selected topics and concepts in contemporary social and political philosophy such as rights, liberty, obligation, the state, welfare, authority, and power. Fall or spring. Ober.

162 AMERICAN POLITICAL THOUGHT (3). A historical and analytical examination of the ideas underlying the political culture and institutions of the United States. Spring. Lienest.

163 MARXISM AND SOCIALISM (3). Consideration of the political thought of major Marxist and socialist schools, including Marxism, Leninism, contemporary Democratic and Revolutionary Socialism with reference to Utopian socialism, and recent controversies on the left. Fall. Staff.

164 ADVANCED FEMINIST POLITICAL THEORY (WMST 164) (3). Prerequisites: Political Science/Women's Studies 67. Examines in greater depth and complexity current issues in feminist political theory. Topics: theories of subjectivity and solidarity; feminist post-structuralist and post-Marxist thinking; gender in the public sphere. Fall and spring. Bickford.

165 PROBLEMS OF MODERN DEMOCRATIC THEORY (3). Major problem areas: definitions, presuppositions, and justifications of democracy, liberty, equality, minority rights, public interest, participation, dissent, and civil disobedience. Fall. Bickford, Leonard.

166 RECENT AND CONTEMPORARY POLITICAL THOUGHT (3). Survey of the historical foundations, central tenets, and political consequences of prominent twentieth-century political theories. Topics include: contemporary liberalism and Marxism, fascism, theories of development, populism, feminism. Fall or spring. Leonard.

167 ADVANCED POLITICAL PSYCHOLOGY (3). Prerequisite: Political Science 66, 69, or 94A. Examines in greater depth a variety of issues in the field of political psychology including: conflict and conflict resolution, socialization, attitude formation, mass movements, leader-follower relationships, and psychobiography. Spring. Staff.

168 RECENT DEVELOPMENTS IN POLITICAL PHILOSOPHY (3). A study of selected recent works of Continental or Anglo-American political theory by authors such as Rawls, Nozick, Waller, Habermas, and Gadjewski. Fall or spring. Leonard.

169 BUSINESS GOVERNMENT RELATIONS (3). Explores the non-market environment of firms and policy makers. Topics include the media, lobbying, antitrust, regulation, product safety, international trade, globalization, and corporate ethics. Emphasis on class discussion and presentation. Spring. Ting.


171 RACE, POVERTY, AND POLITICS (HSAD 171) (3). Definitions of poverty and their policy implications; the composition and causation of poverty; an examination of public policies directed at the alleviation, reduction, and elimination of poverty. Spring. Staff.

172 EXECUTIVE POLITICS (3). This course explores how presidents select policy options, how they decide timing, what shapes their congressional support, and how they build successful coalitions. Spring. Sullivan.

173 GOVERNMENT AND THE ENVIRONMENT (3). Examines political implications of environmental problems; environmental policy making and implementation processes in the United States, and management problems in selected policy areas such as population, energy, pollution, the ocean, land, hazardous waste, wilderness areas. Fall. Staff.

174 MASS MEDIA AND AMERICAN POLITICS (3). Prerequisites: junior/senior standing and Political Science 41. Examination of the role, behavior, and influence of the mass media in American politics. Staff.

175 QUANTITATIVE ANALYSIS FOR PUBLIC POLICY (PLCY 175) (3). Prerequisites: Statistics 11; Economics 70 or equivalent. Application of statistical techniques, including regression analysis, in public policy program evaluation: research design and data collection and management. Spring. Staff.

180 FORMAL MODELS OF POLITICAL SYSTEM (3). An introduction to the use of mathematical models for analyzing political behavior. Fall and spring. McKown.

190 SEMINAR IN DOMESTIC POLICY (PLCY 190) (3). Taught as part of the UNC Washington Policy Semester, the course introduces students to domestic policymaking from the federal perspective, using readings and lectures from the Washington policymaking community. Fall. Stegman.

191 INTRODUCTION TO PUBLIC FINANCE (ECON 140) (3). Principles and practices of the budgetary activities of American governments: federal, state, and local. Students may not receive credit for both Economics 140 and 141. Fall or spring. Akin, Wilde.
Courses for Graduates

200 SCOPE AND METHODS OF POLITICAL RESEARCH (3). Permission of the instructor required. A discussion of the theory and process of political analysis, including philosophy of science, research design, the methods of drawing causal inferences, and of generating data. Stephens, Searing.

201 COMPARATIVE POLITICAL RESEARCH AND ANALYSIS (3). The seminar introduces the beginning graduate student to the central issues and major developments in the field of comparative government and politics. Fall and spring. Steiner, Searing.

202 COMPARATIVE WELFARE STATES (SOCI 221) (3). This course examines the development, achievements, present crisis, and future of welfare states in advanced industrial democracies. Fall, spring. Stephens.

203 AMERICAN POLITICAL BEHAVIOR (3). Theoretical study of mass behavior (i.e., participation, voting, protest) in the American context. Spring. Staff.

204 AMERICAN POLITICAL INSTITUTIONS (PLCY 204) (3). Theory and practice of political institutions in the American context. Fall. Staff.

205 PUBLIC POLICY ANALYSIS (PADM 205) (3). The roles of expertise in policy discourse; the place of values in policy analysis; summarizing preferences; benefits and costs; policy models; policy expertise and democratic political systems. Fall. Staff.

206 INTERVIEWING IN SOCIAL SCIENCE RESEARCH (3). The seminar deals with the theoretical underpinnings and practical execution of interview techniques ranging from the short survey instrument to the adaptation of prolonged clinical interviews. Most of the work emphasizes different varieties of in-depth interview. Fall. Staff.

208 MODELING FOR ENVIRONMENTAL RISK ANALYSIS (ENVR 279) (PLCY 208) (3). Prerequisite, Environmental Sciences and Engineering 180. Quantitative techniques for the analysis of environmental decisions, including application of modeling and sensitivity analysis, probability, value of information. The course explores risk attitudes and conflicting objectives. Fall. Staff.


210 CORE SEMINAR ON AMERICAN POLITICS (3). An overview of research on American politics that introduces students to a wide range of substantive understandings and theoretical perspectives. Fall. MacKuen.

212 INTRODUCTORY POLICY EVALUATION METHODS (PLCY 212) (3). Prerequisite, Political Science 210, 211, 212, 214, Public Administration 226. The role(s), function(s), and strategy of public administrators in the formulation, adoption, and implementation of public policies. Policy from the perspective of the policy maker; cases exploring the relationship of theories to actual policy processes. Spring. Wight.

213 MANAGING PUBLIC POLICY (PLCY 213) (3). Prerequisites, Political Science 210, 211, 212, 214, Public Administration 226. The role(s), function(s), and strategy of public administrators in the formulation, adoption, and implementation of public policies. Policy from the perspective of the policy maker; cases exploring the relationship of theories to actual policy processes. Spring. Wight.

214 GOVERNMENT BUDGETING AND FINANCE (PLCY 214) (3). An introduction to the revenue and expenditure structure of the public sector including revenue policy, expenditure policy, and budget structure and administration. Topics are examined from an applied perspective using analytic criteria from public sector economics, public administration, and political science. Spring. Lowery.

219 POLITICS OF THE ADMINISTRATIVE PROCESS (PLCY 219) (3). The motivations of public agency officials, interactions between bureaucracies and other political actors, and alternative strategies to control bureaucratic power and discretion in making, implementing, and evaluating public policies. Fall. Lowery.


221 PUBLIC POLICY AND ADMINISTRATION (PLCY 221) (3). Alternative explanation of public policies and policy-making processes; introduction to policy analysis as a way to inform choices among policy options; policy implementation through administrative practices and procedures. Fall or spring. Staff.

223 POLITICAL ECONOMY OF THE NATION STATE IN THE WORLD SYSTEM (3). Prerequisite, Economics 161 or 163 or permission of the instructor. Analysis of the interaction between the external sector of the economy and domestic politics in weak capitalist states. Staff.

224 COMMUNIST POLITICAL SYSTEMS (3). An examination of the political evolution and process in societies governed by communist parties. Fall. Staff.

227 ISSUES IN LATIN AMERICAN POLITICS (3). Explores the central issues of Latin American politics and analyzes major theoretical debates. Fall or spring. Huber, Harlyn.

228 LATIN AMERICAN POLITICS: RESEARCH AND ANALYSIS (3). Reviews major works and theoretical perspectives in the literature, assesses contemporary political science research on Latin America, and examines problems of field research. Fall or spring. Harlyn. Huber.

229 POLITICAL ECONOMY OF LATIN AMERICAN DEVELOPMENT (3). Examines effects of state, regime type, and political processes on agricultural and industrial policy in Latin America. Also considers the informal economy, international debt, and relationship between policy and politicization. Fall, spring. Harlyn. Huber.

230 ORGANIZATION DESIGN (3). Prerequisite, Political Science 210, or permission of the instructor. Field theory, motivation, communication, and systems perspectives as theoretical bases for organization design. Spring. Staff.

231 COMPARATIVE BUREAUCRACY (3). A cross-national examination of functions, career patterns, role behavior, and relationships of bureaucratic elites within the context of national political systems. Research on particular countries is emphasized. Fall. Staff.

232 GOVERNMENT AND POLITICS IN METROPOLITAN AREAS (3). Changing patterns of political cooperation and conflict in metropolitan areas; political behavior in central and suburban areas; the large metropolis as a political system, and national policies toward metropolitan problems. Spring. Staff.

236 RESEARCH TOPICS IN CONTEMPORARY SOUTHERN POLITICS (3). Topics vary, but include minority politics in the region, the counter-mobilization of whites during the 1960s, party realignment and the decline of one-party politics, and the impact of the region on national politics. Fall or spring.

237 METHODS FOR POLICY ANALYSIS AND EVALUATION (PLCY 237) (PADM 237) (3). Prerequisite, Political Science 212. Planning 130, or equivalent. Introduction to selected techniques such as the following: multiple regression, decision theory, research design, social experiments and quasi-experiments, program evaluation, and policy-related models. Spring. Lowery.

238 INTERGOVERNMENTAL RELATIONS (PADM 238) (3). Conflict and cooperation among governmental officials representing national, state, and local governments in the United States; changing roles of governments and new mechanisms for intergovernmental collaboration. Spring. Wright.

239 POLICY WORKSHOP (3). Application of theories and techniques of policy analysis and planning to current public problems for actual clients. Focus on design and execution of policy research, and interpretation and presentation of results. Spring. Staff.

240 THEORIES OF INTERNATIONAL RELATIONS (3). Introduction to the central issues and major theoretical developments in the field of international relations, focusing on system structure, political and security issues, and decision making. Fall. McKeown, Biddle.
261 THEORIES OF INTERNATIONAL RELATIONS II (3). Introduction to the central issues and major theoretical developments in the field of international relations, focusing on the politics of international economic relations, law and organization, and fundamental system change. Spring. McKeown.

262 POWER, MORALITY, AND INTERNATIONAL SOCIETY (3). Thucydides, Machiavelli, Hobbes, Kant, twentieth-century Realists (Niebuhr, Morgenthau), Idealists, Neo-Realists, the British School (Wight, Bull), and selected topics (e.g., just war, human rights, food policy). Staff.

263 INTERNATIONAL ORGANIZATION (3). Theories and approaches to the study of international organizations and regimes, plus selected non-economic case studies. Staff.

264 TOPICS IN NATIONAL SECURITY AND FOREIGN POLICY (3). This research seminar examines contemporary substantive issues in national security and foreign policy in light of research organizational and administrative topics. Staff.


266 SEMINAR ON UNITED STATES-LATIN AMERICAN RELATIONS (3). Analysis of the central conceptual concerns and major theoretical approaches to the study of inter-American relations, with a focus on United States foreign policy toward the region. Spring. Schoults.

267 INTERNATIONAL CONFLICT AND COOPERATION (3). An examination of international conflict and cooperative processes in the context of the evolution of the international system. Spring. Staff.

268 INTRODUCTION TO MATHEMATICAL INTERNATIONAL RELATIONS (3). Surveys research in mathematical models of international decision making, bargaining, systemic change, arms races, coalitions, and perception. Philosophic and historical considerations about this field are also discussed.

269 SEMINAR IN PROBLEMS OF U.S. MILITARY POLICY AND CIVIL-MILITARY POLITICS (3). Research seminar in problems of United States military policy and civil-military problems, focused chiefly on deterrence, arms control, and disarmament. Staff.

270 U.S. FOREIGN POLICY (3). This course provides an overview of United States foreign policy and exposes students to the major themes and controversies in the field. Fall, spring. Staff.


272 JUDICIAL POLITICS (3). Survey of recent literature on the politics of judicial institutions and the behavior of judges, lawyers, litigants, and other actors in the judicial process, emphasizing relationships between judicial and other policy-making processes. Spring. McGuire, Unah.

273 PROBLEMS IN CONSTITUTIONAL LAW (3). A survey of issues in American constitutional law, with a special emphasis on the politics of constitutional interpretation. Fall, spring. Staff.

274 SECURITY STUDIES (3). This course introduces students to the major theoretical approaches to the study of national security. Fall, spring. Staff.

275 THEORIES OF FOREIGN POLICY (3). This course is an introduction to the field of foreign policy analysis. Its primary goal is to expose students to the theories and methods of foreign policy research and analysis. Fall, spring. Staff.

276 LOGIC OF POLITICAL INQUIRY (3). A critical examination of models of political inquiry. Empirical (naturalistic), interpretive, and critical metaphors are considered in terms of each model's ontological, epistemological, and practical/political consequences and presuppositions. Fall or spring. Leonard.

277 MAJOR ISSUES IN POLITICAL THEORY (3). An introduction to the major issues of political theory, with emphasis on the major thinkers in the history of Western political thought. Fall or spring. Leonard, Liensch, Oboler.

278 AMERICAN POLITICAL THEORY (3). Survey of issues and problems in American political thought, with analysis of major thinkers and selected topics, and emphasis on the role of family, society, and economy in political theory. Spring. Liensch.

279 CLASSICAL POLITICAL THEORY (3). An introduction to ancient and medieval political thought, in major thinkers and issues. Leonard, Liensch, Bickford.

280 MODERN POLITICAL THEORY (3). An introduction to modern political thought, its major thinkers and issues. Fall or spring. Leonard, Liensch, Bickford.

281 RECENT AND CONTEMPORARY POLITICAL THOUGHT (3). An introduction to recent and contemporary political thought, its major thinkers and issues. Emphasis on Continental thought. Topics include: post-Marx Marxism, critical theory, existentialism, structuralism, post-structuralism. Leonard.


283 MAJOR FIGURES IN POLITICAL THEORY (3). An in-depth study of the primary and secondary literature on one or two major figures in the history of political thought (e.g., Plato, Machiavelli, Hobbes, Marx). Leonard, Liensch, Bickford.

284 INFLUENTIAL WORKS IN DEMOCRACY (SOCI 220) (3). The course covers the major traditions of democratic theory from ancient Greece to the present, ethnographies on political organization, and nineteenth- and twentieth-century observations on democracy. Fall. Bollen, staff.

285 PUBLIC OPINION (3). A study of public opinion, its formation, expression, and impact on political systems and public policy.

286 DYNAMICS OF ELECTORAL POLITICS (3). Change within mass electorates. Topics include issue and attitude change, political realignments, and models of electoral competition. Rabinowitz.

287 POLITICAL SOCIALIZATION (3). The learning process by which individuals acquire values, attitudes, and norms affecting their behavior in the political community, with emphasis on major agencies of socialization: family, schools, peer groups, and media. Staff.

288 COMPARATIVE POLITICAL ECONOMY (3). Examines topics in the comparative political economy of Western Europe such as neo-corporatism, post-industrialism, the politics of industrial relations, and the European community. Fall. Marks.

289 POLITICAL PARTIES (3). Selected problems and issues in the study of American and comparative parties and party systems. Staff.

290 SEMINAR IN SUBNATIONAL POLITICS AND POLICY (3). This course surveys the major topics and research programs in subnational American politics and policy with special attention to the vertical and horizontal intergovernmental interactions inherent within federal political systems. Fall, spring, Lowery.

291 LEGISLATIVE SYSTEMS (3). Institutions and processes in the United States Congress with some cross-national comparisons. Staff.

292 STATISTICS (3). Elementary descriptive statistics and basic principles of statistical inference including estimation and tests of hypotheses. Fall. Steneberger.

293 INTERMEDIATE STATISTICS (3). This course extends the coverage of Political Science 281. Topics to be covered include analysis of variance, multiple and partials correlation, and multiple regression. Spring. Steneberger.

294 INTRODUCTION TO STRUCTURAL EQUATION MODELS (3). Prerequisite: Political Science 282 or equivalent. Introduces structural equation models with observed variables and econometric estimation methods. Some attention to models with unobserved variables and LISREL-type analyses. Macdonald.
284 TIME SERIES ANALYSIS OF POLITICAL DATA (3). Prerequisites, Political Science 282, or permission of the instructor. Discusses the problems that arise when regression methodologies are applied to time series and pooled time series data. Fall. Staff.

285 AMERICAN PRESIDENCY (3). Survey of the substantial literature and research on the American Presidency. Staff.

286 CONGRESS AND THEORY BUILDING (3). This course examines diverse theoretical perspectives on national institutional change, stability, using as our institutional focus the United States Congress between 1789 and 1989. Spring. Staff.

287 MAXIMUM LIKELIHOOD METHODS (3). Prerequisites, Political Science 281 and 282. Introduction to maximum likelihood estimation with applications to political science. Topics include discrete choice analysis, censored and truncated variables, event history analysis, sample selection models, and multilevel inference. Spring. Steenbergen.

290 AFRICAN POLITICS: CHALLENGES OF DEMOCRATIZATION AND DEVELOPMENT (3). Study of the politics of development in contemporary Africa, with emphasis on changing state-society relations. The roles of peasants and women in politics, and prospects for democratization. Fall. Newbury.


292 COMPARATIVE POLITICAL BEHAVIOR (3). Political behavior of the public in cross-national or non-American settings. Political culture, belief systems, participation, protest, revolution, voting behavior, civic behavior, socialization, and media. Fall and spring. Searing.


294 SEMINAR ON POLITICAL PSYCHOLOGY (3). Prerequisite, Political Science 203. This course surveys and evaluates current and past research in political psychology. Topics may include: personality, attitudes and values, socialization, political reasoning, instruction processing, decision making, political identity, and political affect. Spring, Steenbergen. Hurley.

295 THE PSYCHOLOGY OF COLLECTIVE POLITICS (3). Explores the psychological underpinnings of collective politics from the perspective of both individuals and groups. Political behaviors examined include: deliberation, protest, nationalism, and intergroup conflict. Fall. Conover.

300 DESIGN AND ANALYSIS OF EXPERIMENTS AND SURVEYS (3). Completion of Political Science 200 and 281. Introduction to the use of experimental and survey research methods in political science. Topics include: factorial designs, repeated measures design, ANOVA, sampling theory, survey errors and costs, and questionnaire design. Spring, Stephens, Searing.

302 SEMINAR IN INTERNATIONAL RELATIONS (3). Special topics in international relations, such as alliances, bargaining, decision-making, economic interdependence, and international human rights. Fall or spring. McKown.

303 THEORIES OF INTERNATIONAL POLITICS (3). Topics relating to the development of theory in the realm of international politics.

305 SEMINAR ON APPLICATION OF POLITICAL BEHAVIOR RESEARCH TO PUBLIC PROBLEMS (3). Exploration and examination of the ways in which political behavior research can be applied to understanding and ameliorating public problems. Beyle.

311 SEMINAR IN POLITICAL SOCIOLGY (SOCI 311) (3). The relationships between social structure and political decisions. Regimes and social structure; bureaucracies, political associations, and professions; science and politics; closed and open politics; political movements and change. Spring. Stephens.

321 SEMINAR IN AMERICAN GOVERNMENT AND POLITICS (3). Fall. Beyle.

341 DIRECTED READINGS IN POLITICAL SCIENCE (Variable). Directed readings in a special field under the direction of a member of the graduate faculty. By permission only. Fall, spring, and summer. Graduate faculty.

342 SPECIAL TOPICS IN POLITICAL SCIENCE (1-3). Prerequisite, permission of the instructor. Seminar in selected areas of Political Science. Topics vary from year to year. May be repeated for credit. Fall, spring, summer. Graduate faculty.

346 SEMINAR IN INTERNATIONAL COMMUNICATION (JOUR 346) (3). Prerequisite, Journalism 146 or permission of the instructor. Spring.

353 JUDICIAL BEHAVIOR RESEARCH (3).

361 SEMINAR IN POLITICAL THEORY (3). Special topics in political theory such as Marxism and Socialism, Democratic theory, contemporary political thought, or related topics. Fall or spring. Leonard, Liebisch.

380 TEACHING POLITICAL SCIENCE (3). The director of Graduate Studies assigns each teacher to a faculty supervisor, who provides advice on course design, teaching, and related matters. Fall and spring.

393 MASTERS THESIS (3 or more). Fall and spring. Members of the graduate faculty.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Graduate faculty.

395 RESEARCH IN PUBLIC ADMINISTRATION (PADM 395) (Vac.). Fall, spring, and summer. Staff.

DEPARTMENT OF PSYCHOLOGY
PETER A. ORNSTEIN, Chair

Professors
Donald H. Bucorn (164) Sex Roles, Marital Therapy, Depression Assessment
Dianne L. Chambliss (180) Anxiety Disorders. Psychotherapy Research, Cognitive Behavior Therapy, Expressive Emotion
Martha Cox (206) Family Processes and Child Social and Emotional Development; Transition to Parenthood And Marital and Parenting Adaptation; Social and Emotional Development of Children in Racial Poverty; Fathers in Families; Child Care Experiences and Child Development
Linda A. Dykastra (9) Behavioral Pharmacology, Opioid Analgesia, Drugs of Abuse
Karen M. Gil (181) Chronic Illness, Stress and Coping, Pain Management
Peter C. Gordon (170) Psychological Processes Underlying Our Use of Language
Bernadette Gray-Little (16) Sociocultural Influences on Personality, Marital Interaction, Psychopathology
Mark Hollins (17) Sensory Information Processing, Tactile Perception
Chester A. Insko (18) Attitude Change, Balance Theory, Individual-Group Discontinuity
Donald T. Lytle (155) Psychoneuroimmunology, Learning Theory, Comparative Animal Behavior
Vonnie C. Mcloyd (208) Impact of Economic Hardship on Family Processes, Children's Mental Health, and Beliefs about Personal Efficacy
Peter A. Ornstein (28) Cognitive Development, Development of Learning and Memory
Clinical Professors
Paul M. Brinsch (152) Child, Adolescent, and Adult Psychotherapy and Psychoanalysis, Psychological Adjustment of Adoptees
William V. Burlingame, Ethics, Regulatory Psychology, Treatment of Juvenile Sex Offenders
Gary B. Mesich (94) Normalization and Community Programs for Handicapped People, Normal Social and Personality Development

Clinical Associate Professors
Ann Louise Barrick (135) Geropsychology, Behavioral Interventions in Personal Care in Dementia
Stephen G. Flanagan (130) Behavior Analysis and Therapy, Schizophrenia and Other Serious Mental Disorders
Patricia K. Kerig (197) Developmental Psychopathology, Risk and Resiliency in Children Exposed to Intergenerational Conflict and Violence, Development of Gender Differences, Interventions with Children and Families
Arlane Margolis (134) Psychopathology and Treatment of Adolescents and Cognitive Assessment

Clinical Assistant Professors
Laura Clark (179) Psychiatric and Behavioral Symptoms in Alzheimer’s Disease, including MRI Correlates of Symptoms
Nicole Jones (210) Schizophrenia, Substance Use, Forensic Psychology
Clare E. Mundell (201) Psychotherapy with the Severely Mentally Ill, Psychoanalytic Psychotherapy
Scott Schwartz (209) Applied Clinical Research with Adolescents, Diversity Issues in Assessment and Treatment
Marcia Stierer (178) Neurocognitive Functioning and Treatment, HIV, Adult Onset Brain Tumor, Memory and Depression
Jennifer A. Snyder (193) Schizophrenia, Psychiatric Hospitalization, Forensic Psychology, Non-linear Dynamic Systems Analysis

Adjunct Associate Professor
Mark E. Stamos (137) Developmental Psychobiology, Developmental Neurotoxicology, Ontogeny of Learning and Memory Processes

Adjunct Assistant Professor
Josephine Jahan (190) Comparative Animal Behavior, Substance Abuse and Aggression, Neuroendocrinology

Professors Emeriti
John B. Carroll
Elliot M. Cramer
W. Grant Dahlstrom
David A. Ecker
Samuel Fillenbaum
M. David Galinsky
Betty N. Gordon
Edward S. Johnson
Lyle V. Jones
Richard A. King
Eugene R. Long
Barclay Martin
Forrest W. Young

The Department of Psychology offers training for the Doctor of Philosophy degree in the recognized areas of psychology: clinical, cognitive, developmental, experimental and biological, quantitative, and social. Each program is designed to acquaint the students thoroughly with the theoretical and research content of a particular specialty and to train them in the research skills needed to become competent and creative investigators in their specialty area. In addition, certain programs, e.g., the clinical program, focus on the development of competence in appropriate professional skills.
While many of the requirements for a Ph.D. degree vary with the specialty program, certain requirements apply to all psychology graduate students. Each student must: (1) pass a Ph.D. written examination, (2) pass a Ph.D. oral examination, (3) complete a special competency requirement (research competency, foreign language competency, teaching competency, or professional competency), (4) submit an acceptable dissertation and pass an oral examination, (5) engage in research during each year of enrollment, and (6) in most cases, serve as a teaching assistant or teach a course for at least one academic year.

Brochures describing graduate training in these areas may be obtained by written the Department of Psychology. New students are accepted for admission in the fall semester only. Individuals seeking the M.A. degree only are not accepted.

Courses for Graduates and Advanced Undergraduates

The prerequisites for each course are provided for the general guidance of the student in consultation with an advisor. Any deviation from the required prerequisite sequence must be approved by the instructor teaching the course. Such clearance must be obtained before registering for the course.

NOTE: General Psychology 10 or the equivalent is prerequisite to all courses numbered above 100.

109 TOPICS IN COGNITION (3). Prerequisite: Psychology 20, 21, 22, or 23. Examines selected topics in cognitive psychology examining issues related to thinking, memory, consciousness, language or higher-level perception. The selected topics can vary from semester to semester. As announced, Johnson, P. Gordon.

101 CONDITIONING AND LEARNING (Neurobiology 101C) (3). Prerequisite: Psychology 22. A comprehensive survey of the methods, findings, and theories of classical and operant conditioning. Students develop skills necessary in memory, consciousness, language or higher-level perception. The selected topics can vary from semester to semester. As announced, Eckerman.

102 BIOLOGICAL FOUNDATIONS OF BEHAVIOR (Neurobiology 102b) (3). Prerequisite, Psychology 22 or Biology 11. Ethological, genetic, and physiological variables are studied in relation to their behavioral effects. As announced, Lyle.

103 INTRODUCTION TO MATHEMATICAL PSYCHOLOGY (3). Prerequisite, Psychology 30, Mathematics 32, or permission of the instructor. The use of mathematical models in psychology, with topics selected from measurement, scaling, psychophysics, learning, decision, and choice theory. As announced, Staff.

104 CURRENT TOPICS IN PSYCHOLOGY (3). Prerequisite, Psychology 10 and permission of the instructor. Various special areas of psychological study as needed. Course may be taken more than once. As announced, Spring. Staff.

NOTE: Psychology 104 will not fulfill a 100-level course requirement for a B.A. or B.S. degree in Psychology.

106 PHYSIOLOGICAL PSYCHOLOGY (Neurobiology 106) (3). Prerequisite, Psychology 10, 23, or permission of the instructor. Elements of neurophysiology, neuroanatomy, and neurochemistry as they apply to the understanding of brain-behavior relationships. As announced, Carroll.

107 PHYSIOLOGICAL PSYCHOLOGY LABORATORY (3). Prerequisite, Psychology 23 or 106. Hands-on laboratory course designed to introduce students to experimental protocols emphasizing brain-behavior relationships. Topics include: gross neuroanatomy, stereotaxic surgery, and the effects of drugs on behavior. As announced, Carroll or staff.

109 APPLIED BEHAVIORAL ANALYSIS (3). Prerequisite, Psychology 22 and 80 or permission of the instructor. A survey of applications of learning theory in solving clinical, educational, and societal problems. Practicum experience included. As announced, Carroll.

112 HISTORICAL TRENDS IN PSYCHOLOGY (3). Prerequisite, Psychology 10. Limited to senior majors or to graduate students in Psychology; others by permission of the instructor. Overview of the origins of psychological concepts, movements, and fields of study. As announced, Staff.

120 SENSORY PROCESSES (3). Prerequisite, Psychology 20, 21, or 23. Each year the course deals with a specific sensory topic, such as "color vision" or "the chemical senses." As announced, Hollins.

121 ADVANCED PERCEPTUAL PROCESSES (3). Prerequisite, Psychology 20, 21, or 23. The perception of shape, space, and motion; the role of cognitive factors in perception. As announced, Hollins.

122 HUMAN MEMORY (3). Prerequisite, Psychology 20 or 22. Theoretical and applied issues in human memory. As announced, Hartman.

123 INTRODUCTION TO COGNITIVE SCIENCE (3). Prerequisite, Psychology 20 or equivalent. An introduction to the interdisciplinary study of the mind, intelligent behavior, information processing, and communication in living organisms and the computer. As announced, Harman.

124 PSYCHOLOGICAL APPLICATIONS OF DRUGS (3). Prerequisite, Psychology 22 and 80. This course investigates the pharmacological effects and the clinical efficacy of drugs used to treat behavioral disorders. As announced, Pickard.

125 PSYCHOLOGY OF LANGUAGE (3). Prerequisite, Psychology 20 or Linguistics 30 or Linguistics 100. An examination of the possible relations between psychology and linguistics, this course considers problems in the acquisition of language and particularly recent work in experimental psycholinguistics. Staff. As announced, Gordon.

126 HUMAN INFANCY (3). Prerequisite, Psychology 24. The primary focus of this course is the psychological development of human infants but other perspectives are considered: philosophy, parenting, health and public policy, the law. As announced, Reznick.

127 COGNITIVE DEVELOPMENT (3). Prerequisite, Psychology 10 and 24. An examination of the development of attention, perception, learning, memory, and thinking in normal children. As announced, Ornstein, Kuntz-Costes. As announced, Staff.


129 DEVELOPMENT OF SOCIAL BEHAVIOR AND PERSONALITY (3). Prerequisite, Psychology 24, 28, and 30. Developmental processes during early childhood as they relate to social behavior and personality. As announced, Garvey or Staff.


131 PERSPECTIVES ON NON-PARENTAL CHILD CARE (3). Prerequisite, Psychology 24. This course explores the history, politics, and practice of nonparental child care through readings, lectures, and a semester-long internship in a child care center. As announced, Reznick.

132 THE BRAIN AND COGNITION (3). Prerequisites, Psychology 20, Psychology 21, 22, or 23 or Biology 121 or 154. Introduction to cognitive neuroscience. Higher mental processes including attention, memory, language and consciousness will be covered, with an emphasis on the neural mechanisms which form the substrates of human cognition. As announced, Gordon, Harman, Hopfinger.

135 BEHAVIORAL DECISION THEORY (3). Prerequisite, Psychology 10 or permission of the instructor. Simple mathematical and psychological models of judgment and choice, and related experiments, are treated, as are applications to real-world problems in medical, environmental, policy, business, and related domains. As announced, Staff.

140 ADVANCED PERSONALITY (3). Prerequisite, Psychology 28 or graduate standing. An in-depth analysis of major theoretical issues in personality study. As announced, Gray-Little, Lowman.
141 PSYCHOLOGY OF ADULTHOOD AND AGING (3). Prerequisite, Psychology 24. A developmental approach to the study of adulthood, from young adulthood through death. Topic includes adult issues in personality, family dynamics, work, leisure and retirement, biological and intellectual aspects of aging, dying and bereavement. As announced. Barrick or staff.

142 PSYCHOLOGY OF BLACK AMERICANS (3). Prerequisite, Psychology 28. This course focuses on the personal characteristics of black Americans as these have been studied by psychologists and other behavioral scientists. Various methodological approaches are considered. As announced. Gray-Linley.

144 PSYCHOLOGICAL DISORDERS OF CHILDHOOD AND ADOLESCENCE (3). Prerequisites, Psychology 10, 24, and 80, or graduate standing. A survey of theories bearing on atypical development and disorders of behavior, and an examination of major child and adolescent behavior problems and clinical syndromes. Fall and spring. Husson; Kupermid, Margolis.

145 HEALTH PSYCHOLOGY (3). Prerequisite, Psychology 80 or graduate standing. An in-depth coverage of theoretical issues and clinical manifestations of psychological responses characteristic of individuals with chronic physical disorders. Fall and spring. Gil, Stekete.

146 BEHAVIOR AND THE BRAIN: INTRODUCTION TO NEUROPSYCHOLOGY (3). Prerequisite, Psychology 20 or 23. Introduction to brain-behavior relationships through the study of the effects of brain damage. Focus on cognitive and emotional processes in humans as they are affected by diseases and trauma to the brain. Fall. Hartman.

147 INTRODUCTION TO CLINICAL PSYCHOLOGY (3). Prerequisites, Psychology 30 and 80. Overview of clinical psychology-history, scientific basis, and major activities and concerns including assessment, psychotherapy, and other psychological interventions, community psychology, ethics, and professional practice. Spring. Chambless.

148 TESTS AND MEASUREMENT (3). Prerequisites, Psychology 10 and 30. Basic psychometric theory underlying test construction and utilization. Detailed study of tests and instruments used in assessing intellectual functioning, educational, personality, and personnel selection. Fall. Staff.


150 STRESS AND COPING IN CHILDREN AND ADOLESCENTS (3). Prerequisite, Psychology 24. Examines issues related to the role of risk and protective factors in the development of psychopathology in children and adolescents. The course provides practical experience with youth. Fall, spring. Kupermid.

152 ATYPICAL PERSONALITIES AND GROUPS I (3). Prerequisite, Psychology 80. Addresses methods to assess, treat, and rehabilitate adults or elderly with serious mental disorders. Includes volunteering in a mental health agency serving people with schizophrenia, psychosis, or dementia. Fall, Barrick, Planagan. Spring, Barrick.

153 ATYPICAL PERSONALITIES AND GROUPS II (3). Prerequisite, Psychology 152. This course studies persons and groups labeled as different, outsiders, deviants, stigmatized, or occupying disvalued roles. Focus is placed on how these individuals present themselves in personal and written. Spring. Staff.

150 AUTISM (3). Prerequisites, Psychology 24 and 80. This intensive service-learning seminar on autism includes a supervised community placement. Topics include: historical perspective, diagnostic issues, etiological theories, assessment patterns of functioning, developmental/ life span issues, family concerns, and intervention approaches. Spring. Staff.

165 POVERTY AND DEVELOPMENT (3). Prerequisite, Psychology 10. Poverty is one of the most consistent and influential risk factors for problematic development. This course focuses on the scientific study of how poverty affects development across the human life span. Taylor.

170 RESEARCH IN DEVELOPMENTAL PSYCHOLOGY (3). Prerequisites, Psychology 24 and 30. Introduction to the issues, methods, and outcomes of research in developmental psychology. Demonstrational projects designed and completed. One lecture and four laboratory hours, as announced. Staff.

171 DEVELOPMENT OF BLACK CHILDREN (3). Prerequisite, Psychology 24. Topics include peer and social relations, self-esteem, identity development, cognitive development, school achievement, parenting, family management, and neighborhood influences. Psychology 30 recommended. Fall. Rowley.

172 FAMILY AS A CONTEXT FOR DEVELOPMENT (3). Prerequisite, Psychology 24 and 30 or permission of the instructor. Explores how the family influences children's development. Topics include genetics, family structure (e.g., single parents, working mothers, divorce, number of siblings); discipline, parental values and beliefs; ethnic diversity. Fall, spring. Kurza-Costes.

183 CONTEMPORARY SEX ROLES (Women's Studies 183) (3). Prerequisite, Psychology 10. Covers theories and research in the areas of constitutional and social learning on sex differences; sex-role identification and the assessment of masculinity and femininity; sex differences in such areas as intellectual accomplishment, achievement, dependency and aggression; and sex differences in relation to behavior disorders. As announced. Margolis or staff.


185 SOCIAL COGNITION (3). Prerequisites, Psychology 30 and 33. Theory and research in social psychology which explores the cognitive processes underlying social phenomena. Specific topics covered include: attributions, emotions, automaticity, heuristics, self goals, stereotyping, expectations, social motives, and others. Fall, spring. Staff.

186 NONVIOLENT CONFLICT RESOLUTION (PWAD 186) (3). Prerequisite, Psychology 10 or permission of the instructor. Theories of conflict and conflict resolution are systematically applied in the contexts of personal, interpersonal, small group, and interethnic conflict, with a focus on empirical knowledge and acquisition of skills for nonviolent dispute resolution. Fall. Staff.

187 APPLIED SOCIAL PSYCHOLOGY (3). Prerequisites, Psychology 30 and 33. Applications of social psychological theory/research to practical social problems and issues, e.g., organizational behavior, job satisfaction, effects of advertising and media on behavior, and discrimination- affirming action. As announced. Staff.

188 SMALL GROUPS (3). Prerequisites, Psychology 30 and 33 or permission of the instructor. Intensive survey of research and theory on behavior in small groups combined with appropriate experience in studying various structured groups. As announced. Thompson or staff.

189 INTERPERSONAL PROCESSES (3). Prerequisites, Psychology 30 and 33, or permission of the instructor. Intensive coverage of normal interpersonal processes, focusing on the dyad. As announced. Rughart or staff.

190 STEREOTYPING, PREJUDICE, AND DISCRIMINATION (3). Prerequisites, Psychology 30 and 33. Examines the determinants, functions, processes, and consequences of stereotyping, prejudice, and discrimination. Prospects for change are considered. Class presentations and participation required. Psychology 50 desirable, but not required. As announced. Staff.

191 ATTITUDE CHANGE (3). Prerequisites, Psychology 30 and 33, or permission of the instructor. A detailed consideration of the theoretical issues in attitude and belief change. As announced. Thompson or staff.
Courses for Graduates

200 EXPERIMENTAL METHODS: COGNITIVE PROCESSES (3). Principal topics include: psychophysics, information processing, memory, cognition. Spring. Staff.

201 BEHAVIOR AND ITS BIOLOGICAL BASES I (Neurobiology 201a) (3). A survey of psychological and biological approaches to the study of sensory and perceptual information processing; perceptual development. Fall. Staff.

202 BEHAVIOR AND ITS BIOLOGICAL BASES II (Neurobiology 202) (3). A survey of psychological and biological approaches to the study of basic learning and higher integrative processing. Spring. Staff.

203 PERSONALITY RESEARCH METHODS (3). Prerequisites, Psychology 220, 221, and 248 are advisable. Covers empirical research on personality structure and processes, person-situation interactions, and other current issues in the area. Spring. Staff.

204 ADVANCED BIOLOGICAL PSYCHOLOGY: CENTRAL NERVOUS SYSTEM (Neurobiology 204) (3). Prerequisite, Psychology 106 or equivalent. Each fall one special topic will be covered in depth: e.g., neural bases of memory storage, homeostasis, and perception. Format includes lectures and seminar meetings with student presentations. Fall. Shinkman.

205 ADVANCED BIOLOGICAL PSYCHOLOGY: AUTONOMIC NERVOUS SYSTEM (Neurobiology 205) (3). Prerequisites, Psychology 106 and/or 202, or permission of the instructor. Autonomic nervous system bases of emotion, motivation, and learning. Two lecture and two laboratory hours a week, as announced. Staff.

207 APPLICATIONS OF EXPERIMENTAL PSYCHOLOGY TO HEALTH RESEARCH (Neurobiology 207) (3). This course provides a critical analysis of interdisciplinary research within experimental psychology, including such topics as psychopharmacology, psychoneuroimmunology, psychophysiology, and animal models of brain/behavior disorders. Fall. Cardelli, Dykstra, Girdler, Light, Lyde, Packer.

208 A, B, C, D, E, F PROSEMINAR IN QUANTITATIVE PSYCHOLOGY (1). An introduction to (A) data analysis and visualization, (B) research synthesis (meta-analysis), (C) analysis of covariance structures, (D) practice in Quantitative Psychology research, (E) computer simulation methods, (F) test theory. Fall. Staff.

209 A, B, C, D, E, F, G PROSEMINAR IN COGNITIVE PSYCHOLOGY (1). An advanced introduction to (A) history of cognitive psychology, (B) learning and memory, (C) sensation and perception, (D) speech and language, (E) judgment and thinking, (F) methods and models, (G) cognitive aging, and (H) cognitive neuropsychology. Fall and spring, as announced. Staff.

210 HISTORY OF PSYCHOLOGY (3). Review of the history of major areas of psychology, with special emphasis on the conceptual and methodological underpinnings of the discipline. Spring. Garvey.

212 CONTEMPORARY PSYCHOLOGICAL TRENDS (3). Prerequisite, graduate standing. Different perspectives on the task of psychology with a discussion of selected contemporary problems. Fall. Staff.

216 DEVELOPMENTAL PSYCHOLOGY: METHODOLOGY I (3). Philosophical and sociological perspectives on research in developmental psychology, with specific applications to ongoing projects. As announced. Staff.

217 DEVELOPMENTAL PSYCHOLOGY: METHODOLOGY II (3). Techniques and research designs appropriate for the study of the development of behavior. Supervised experience in the planning of experiments and data analysis. As announced. Staff.

220 PERSONALITY: THEORY AND RESEARCH (3). Prerequisite, permission of the instructor. Review and critical analysis of major theoretical and empirical approaches to the study of personality. Fall. Staff.

221a FUNDAMENTAL ISSUES IN PSYCHOTHERAPY: ADULT (1). Prerequisite, graduate status in clinical psychology. Brief survey of theoretical and practical issues in psychotherapy with adults. Factors common to many approaches and development of rapport will be discussed. Fall. Galinsky.

221b FUNDAMENTAL ISSUES IN PSYCHOTHERAPY: CHILD (1). Prerequisite, graduate status in clinical psychology. Brief survey of theoretical and practical issues in psychotherapy with children. Factors common to many approaches and development of rapport will be discussed. Spring. Brinich.

222 EXPERIMENTAL ANALYSIS OF BEHAVIOR (3). Prerequisite, Psychology 201 or permission of the instructor. Applications of operant conditioning procedures to the analysis of complex behavior in man and animals. Students perform original experiments. One lecture and six laboratory hours a week. Fall. Staff.

223, 224 DIRECTED RESEARCH SEMINAR IN SOCIAL PSYCHOLOGY (3). Prerequisites, first-year social psychology graduate student or permission of the instructor. Directed research problems and seminar discussion of related issues. Fall and spring. Staff.

225 INTERPERSONAL PROCESSES AND CLOSE RELATIONSHIPS (3). Prerequisite, Psychology 238 or permission of instructor. Intensive study of the processes by which adult close relationships are initiated and developed. Fall or spring. Rubart or staff.

226 INDIVIDUAL CHOICE BEHAVIOR (3). Prerequisite, permission of the instructor. Descriptive and normative algebraic and stochastic models for individual decision making with applications to behavioral science. Fall. Staff.

227 INTRODUCTION TO CLINICAL PSYCHOLOGY (3). Prerequisite, graduate standing. Survey of methods and findings in psychodiagnosics, psychotherapy, and mental health practices. As announced. Staff.

228 ADVANCED SOCIAL PSYCHOLOGY (3). Prerequisite, Psychology 238 or permission of the instructor. In-depth study of interpersonal relationships. Spring. Staff.

230 MULTIDIMENSIONAL SCALING (3). Prerequisites, Psychology 282 and 284, or equivalent. Survey with application to dissimilarity data, of the algebraic, geometric, and computational bases of multidimensional scaling methods, with emphasis on individual differences models and nonlinear transformation. Alternate years. Staff.

231 STRUCTURAL EQUATION MODELS WITH LATENT VARIABLES (3). Prerequisite, Psychology 282 or permission of the instructor. Examination of a wide range of topics in covariance structure models, including their history, underlying theory, controversies, and practical use with major computer packages. As announced. Panter.

232 TEST THEORY AND ANALYSIS (3). Prerequisite, Psychology 282. Survey of classical test theory and more recent developments in item analysis and test construction. As announced. Staff.

233 METHODS OF SOCIAL PSYCHOLOGY (3). Prerequisite, Psychology 238 or permission of the instructor. Methods of investigation in social psychology with primary emphasis on experimental design and the nature of the experimental situation. Fall. Insko or staff.

234 MATHEMATICAL PSYCHOLOGY (3). Prerequisite, permission of the instructor. Development and applications of mathematical models in theoretical and experimental psychology. Topics selected from learning, memory, perception, thinking, attention, decision making. As announced. Staff.

235 TOPICS IN ATTITUDE RESEARCH (3). Prerequisite, Psychology 238 or permission of the instructor. A critical examination of selected topics in attitude theory and change. Spring. Insko or staff.

236 FACTOR ANALYSIS (3). Prerequisite, Psychology 282 or permission of the instructor. Advanced topics in factor analytic models, multivariate correlational models, and analysis of covariance structures as applied in behavioral research. As announced. Panter.
237 ANALYSIS OF FREQUENCY TABLES IN BEHAVIORAL RESEARCH (3). Prerequisite, Psychology 282 or permission of the instructor. An introduction to the analysis of frequency data, including measures of association, and the use of log-linear models and logit models in the behavioral sciences. Alternate years. Staff.

238 ADVANCED SURVEY OF SOCIAL PSYCHOLOGY (3). Prerequisite, graduate standing or permission of the instructor. Survey of research and theories of attitude change, interpersonal relations, and small groups. Fall. Staff.

239 DATA ANALYSIS AND VISUALIZATION (3). Prerequisite, Psychology 282 or permission of the instructor. Survey, with application to behavioral data, of such data analysis and visualization methods as principal components analysis, factor analysis, multidimensional scaling, correspondence analysis, cluster analysis, regression analysis, and redundancy analysis. Alternate years. Staff.

240, 241 INTRODUCTION TO CLINICAL ASSESSMENT (3). Prerequisite, first-year graduate status in clinical psychology. Lecture and discussion on the nature and theory of psychological assessment. Training in administration, scoring, and interpretation of such basic techniques as WAl-S, WISC, Rorschach, TAT, and MMPI. Two lectures and two laboratory hours a week. Fall and spring. Lowman.

242 EMPIRICALLY VALIDATED APPROACHES TO CHILD AND FAMILY PSYCHOTHERAPY (3). Prerequisite, graduate status in clinical psychology. This course covers the research bases and clinical application of psychotherapeutic interventions that have demonstrated empirical validity for assisting children and families. Fall. Staff.

243 EMPIRICALLY VALIDATED APPROACHES TO ADULT PSYCHOTHERAPY (3). Prerequisite, graduate status in clinical psychology. This course covers the research bases and clinical application of psychotherapeutic interventions that have demonstrated empirical validity for assisting adult clients. Fall. Staff.

244, 245 ADVANCED PSYCHOPATHOLOGY (3). Prerequisite, first-year graduate status in clinical psychology. The major forms of psychopathology are examined within a development framework. Fall and spring. Gray-Little, Hussong.

246 INTRODUCTION TO NEUROPSYCHOLOGY (3). For graduate students only. Introduction to brain-behavior relationships through the study of the effects of brain dysfunction on cognitive and emotional processes. Spring. Hartman.

247 ETHICS AND LEGAL ISSUES IN CLINICAL PSYCHOLOGY (1). Prerequisite, graduate standing in clinical psychology. A survey and discussion of the ethical and legal issues that clinical psychologists confront in a variety of professional settings. Fall. Butlingame.

248 OBJECTIVE PERSONALITY MEASUREMENT (3). Intensive study of theory and research on objective techniques useful for personality assessment, standard and special inventories, checklists, and other devices are investigated at item, scale, and profile levels. Fall. Staff.

250 ADVANCED ADULT ASSESSMENT (3). Prerequisite, Psychology 241. Consideration of how various forms of assessment data can be utilized in understanding the structure and dynamics of adult personalities; problems of differential diagnosis, brain damage, etc., are considered. Two lecture and two laboratory hours a week. Fall. Baucum.

251 ADVANCED CHILD ASSESSMENT (3). Prerequisite, Psychology 240. Theory, research, and application of objective and projective techniques for behavioral, emotional, psychiatric, interpersonal, and social cognitive assessment of children and adolescents. Two lecture and two laboratory hours a week. Spring. Kupersmidt.

253 INTRODUCTION TO COMMUNITY PSYCHOLOGICAL APPROACHES (3). Survey of such topics as social contributions to psychopathology, comprehensive and integrated service delivery systems, consultation, primary prevention, manpower innovations, program evaluation, and epidemiological approaches. Fall. Lowman.

254, 255 CLINICAL PRACTICUM (3). Prerequisite, second-year graduate status in clinical psychology. Supervised experience in psychological assessment and psychotherapy. Six to eight laboratory hours a week. Fall and spring. Staff.

256, 257 CLINICAL RESEARCH METHODS (3). Prerequisite, graduate status in clinical psychology. Analysis of clinical and personality research in terms of their contribution to knowledge, their limitations, possibilities for their improvement, further research they suggest, etc. Preparation of individual research proposals for class presentation and critical evaluation. Three hours a week. Fall. Kupersmidt or staff.

258 METHODS OF APPLIED SOCIAL PSYCHOLOGY (3). Prerequisite, graduate standing. Supervised research experience in applied setting and accompanying methods of nonlaboratory research, including nonquantitative methods of social psychology and evaluation of quasi-experimental and nonexperimental designs. Spring. Staff.

259 CLINICAL RESEARCH SEMINAR (2). Prerequisite, graduate status in clinical psychology. Psychology 256. Designing and presenting research proposals in individual students' research areas in oral and written form. Critiquing research proposals. Research ethics and preparing and evaluating protocols for ethical review. Spring. Chambless.

260 HUMAN COGNITIVE ABILITIES (3). Prerequisite, Psychology 239 recommended. Applications of psychometric and experimental methods to the study of human intellectual abilities and processes, with special attention to factor-analytic studies. As announced. Staff.

264, 265 ADVANCED CLINICAL PRACTICUM AND PROFESSIONAL ETHICS (3). Prerequisites, Psychology 254 and 255. Supervised clinical work in an area of particular interest to the student. Clinical activity is coordinated with reading and discussion of literature or professional ethics. Fall and spring. Staff.

266 SELECTED CLINICAL PRACTICUM (1, 2, or 3, can be repeated). Prerequisite, Psychology 265. Individualized clinical practicum for advanced doctoral students in Clinical Psychology. Supervised experience in psychotherapy, psychological assessment, and consultation. Fall, spring. Baucum.

270 MEASUREMENTS OF LANGUAGE BEHAVIOR (3). Prerequisite, permission of the instructor. Procedures for the quantitative measurement of language elements (words, text content, etc.) and performance (e.g., speech rate, language acquisition, vocabulary, comprehension, verbal aptitudes). As announced. Staff.

271 CHOICE BEHAVIOR IN THE DYAD (3). Psychological and mathematical models of two-person interaction with applications to the social and behavioral sciences. Fall. Staff.

272 GROUP CHOICE BEHAVIOR (3). Psychological and mathematical models of n-person interaction in cooperative and noncooperative decision situations with applications. Spring. Staff.

273 ADVANCED SOCIAL DEVELOPMENT (3). Current thinking and research relevant to social, emotional, and personality development across the life span. Topics include parent-child interaction, peer relations, aggression, competence, sex roles, and gender differences. Fall. Cairns, Gartey.

274 ADVANCED COGNITIVE DEVELOPMENT (3). This course covers the development of attention, perception, learning, memory, thinking, and language, beginning in infancy and covering the life span from both information processing and Baldwin-Piaget approaches. Spring. Ornstein, Kurtz-Costes.

275 DEVELOPMENTAL ASSESSMENT (3). Introduction to instruments used for assessment of development and cognition in infants, preschoolers, and school-aged children with primary focus on research issues. Practice administration of instruments in field settings. Spring. Staff.

278 DEVELOPMENTAL PSYCHOLOGY: HISTORY AND THEORY (3). Drawing upon materials presented in the previous content and method courses, this class examines in depth various types of developmental theories. As announced. Staff.
279 ADVANCED FAMILY THEORY AND RESEARCH (3). Research related to family processes, especially regarding the developmental consequences of family environments on children. Topics include divorce, cognitive development, single parents, parental employment, discipline, cultural context. As announced. Kurz-Coplin.

281 STATISTICAL METHODS IN PSYCHOLOGY I (4). Prerequisite: a course in introductory statistics. Data analysis, sampling, applied probability, elementary distribution theory, principles of statistical inference. Fall. Staff.

282 STATISTICAL METHODS IN PSYCHOLOGY II (4). Prerequisite: Psychology 281. Statistical estimation and hypothesis testing for linear models (ANOVA, ANCOVA, regression analysis); statistical models in the design and analysis of experiments. Spring. Staff.

283 INTRODUCTION TO MULTIVARIATE TECHNIQUES FOR THE BEHAVIORAL SCIENCES (3). Prerequisite: Psychology 282 or permission of the instructor. An introduction to linear regression and multivariate statistical techniques as employed in the behavioral sciences with particular emphasis on analytic techniques and interpretation of results. As announced. Staff.

284 QUANTITATIVE RESEARCH SYNTHESIS (META-ANALYSIS) (3). Prerequisite: Psychology 282 or permission of the instructor. Survey of research synthesis including history; problem formulation; statistical concerns; describing and combining studies; combining p-values; testing for heterogeneity; accounting for moderator variables; fixed, mixed, and random effects models; publication bias. Alternate years. Vevea.

285 COMPUTATIONAL STATISTICS (3). Prerequisite: Psychology 282 or permission of the instructor. Current computational environments for data analysis and visualization are taught and used as a basis for understanding current (and creating new) methods of computational statistics and dynamic statistical graphics. Fall. Young.

286 DEVELOPMENTAL PSYCHOBIOLOGY (3). Provides an introduction to psychobiological research, focusing on early development in animals. Topics include embryology; developmental neurobiology; the development of sensory and communication systems; and social behavior. As announced. Gaitey.

289 VISUAL PERCEPTION (Computer Science 277) (3). Prerequisites: Computer Science 235 (vision segment). Psychology 209A, or equivalent. Surveys form, motion, depth, scale, color, brightness, texture, and shape perfection. Includes computational modeling of vision, experimental methods in visual psychophysics and neurobiology, recent research, and open questions. As announced. Staff.

290 ADVANCED TOPICS IN MEMORY (3). Prerequisite: permission of the instructor. This course reviews recent theoretical and empirical advances in memory research. Topics include large-scale models of memory encoding and retrieval and modular models of memory. Fall and spring. Hishman.


299 APPRENTICESHIP IN DEVELOPMENTAL PSYCHOLOGY (1, 2, or 3). Supervised research and practicum experience in developmental psychology. As announced. Staff.

300 SPECIAL READINGS IN PSYCHOLOGY (3). Prerequisite: permission of the instructor. Intended for advanced graduate students. Fall and spring. Staff.

301 SEMINAR IN THE EXPERIMENTAL ANALYSIS OF BEHAVIOR (3). Limited to graduate students in Psychology. Selected advanced topics depending on the interest of the instructor and the students. Three to six hours a week. Fall and spring. Eckerman.

302 SEMINAR IN THE BIOLOGICAL FOUNDATIONS OF PSYCHOLOGY (Neurobiology 302) (3). Prerequisite: permission of the instructor. Limited to graduate students in Psychology and Neurobiology. Lectures and seminar presentations on a wide range of topics in the area of physiological psychology. Fall and spring. Carelli.

304 SEMINAR IN GENERAL PSYCHOLOGY (3). Limited to graduate students in Psychology. Selected advanced topics depending on the interest of the instructor and students. Three to six hours a week. Fall and spring. Staff.

306 SEMINAR IN DEVELOPMENTAL PSYCHOLOGY (3). Prerequisite: permission of the instructor. Intensive study of selected topics in developmental psychology. As announced. Staff.

307 SEMINAR IN APPLIED DEVELOPMENTAL PSYCHOLOGY (3). Prerequisite: permission of the instructor. Intensive study of the application of developmental principles. As announced. Staff.

308 PROSEMINAR IN DEVELOPMENTAL SCIENCE (3). Permission of the instructor. Intensive study of selected topics in human development that are being explored by members of The Carolina Consortium on Human Development. Fall and spring. Staff.

320 SEMINAR IN PERSONALITY (3). Prerequisite: permission of the instructor. Selected advanced topics depending on the interest of the instructor and students. As announced. Staff.

321 SEMINAR IN EXPERIMENTAL HEALTH PSYCHOLOGY (3). An in-depth treatment of research topics in behavioral and biological aspects of health psychology. Fall and spring. Lytle, Light.

322 SEMINAR IN CLINICAL HEALTH PSYCHOLOGY (3). An in-depth analysis of psychosocial variables in health and illness with an emphasis on the clinical and developmental aspects of health psychology. Spring. Gil.

323 BEHAVIORAL PHARMACOLOGY (Neurobiology 332, Pharmacology 332) (3). Prerequisite: Psychology 124 or permission of the instructor. Basic principles of pharmacology and behavior analysis in relation to drugs that affect the central nervous system. Spring. Dykstra.

324 CLINICAL PSYCHOPHARMACOLOGY (3). Examinations of the clinical efficacy, side effects, and neuropharmacological actions of drugs used in the treatment of behavioral disorders. Additional topics include the behavioral and neuropharmacological actions of drugs of abuse. Spring. Picker.

325 SEMINAR IN THEORETICAL-EXPERIMENTAL PSYCHOLOGY (1, 2, or 3). As announced. Staff.

326 SEMINAR IN CLINICAL PSYCHOLOGY (1, 2, or 3). As announced. Staff.

327 SEMINAR IN ABNORMAL PSYCHOLOGY (1, 2, or 3). As announced. Staff.

328 SEMINAR IN SOCIAL PSYCHOLOGY (3). Prerequisite: Psychology 238 or permission of the instructor. Fall or spring. Staff.

330 SEMINAR IN QUANTITATIVE PSYCHOLOGY (1, 2, or 3). As announced. Staff.

331 PROFESSIONAL PROBLEMS IN PSYCHOLOGY (1). Prerequisite: permission of the instructor. Consideration of problems facing academic psychologists. Fall. Staff.

332 LABORATORY IN COLLEGE TEACHING (3). Specific training in presentation and interpersonal skills needed by college teachers, such as planning, lecturing, discussing, motivating, and evaluating. Fall. Lowman.

333, 334 RESEARCH SEMINAR IN EXPERIMENTAL PSYCHOLOGY (3). Prerequisite: graduate standing in psychology. Students design and conduct a supervised research project and engage in critical discussion of research performed by other students and faculty. Fall and spring. Lytle.

336 SEMINAR IN COGNITIVE PSYCHOLOGY (1, 2, or 3). Prerequisite: permission of the instructor. Discussion and critical evaluation of various theories of thinking; theories of concept formation, problem solving, and reasoning. As announced. Staff.
341 ADVANCED RESEARCH (3). Six laboratory hours a week. Fall and spring. Staff.

393 MASTER'S THESIS (3 or more). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

604 AGING AND HEALTH (SOWO 604, DENT 604, PHPR 604, NURS 604, HMSC 604, FMME 480, MEDI 480) (3). Prerequisite, Psychology 10 (or Psychology 604 only). Introduction to normal aging, diseases of aging, mental health issues, and use of health services by older adults. This course will not fulfill a 100-level course requirement for a B.A. or B.S. degree in Psychology. Fall. Ikkin-Zimmerman, Callahan, Sloane.

607 AGING AND PUBLIC POLICY (SOWO 266, DENT 607) (3). Prerequisite, Psychology 10. Provide students (all disciplines) with a general background in the major economic, health, and social policy issues facing the nation and the state resulting from the aging of our society. This course will not fulfill a 100-level course requirement for a B.A. or B.S. degree in Psychology. Spring. Ikkin-Zimmerman, Alipeter, Lamb.

**SCHOOL OF PUBLIC HEALTH**

WILLIAM L. ROPER, Dean
James Thomas, Associate Dean for Academic Programs

The School of Public Health was organized in 1936 as a division within the School of Medicine at the University of North Carolina. Separate status as a school of public health was granted in 1939, and the first graduate degrees were awarded in 1940. Carolina's School of Public Health was the first school of public health established within a state university. It recently was rated the top school of public health at a public university (U.S. News & World Report, April 2001). Today, along with the schools of Medicine, Dentistry, Nursing, and Pharmacy, the School of Public Health is a unit of the Division of Health Affairs. The School of Public Health is one of twenty-seven such schools in the United States accredited by the Council on Education for Public Health.

The mission of the School of Public Health is to improve the health and well-being of the population. The school accomplishes this mission through the interaction of:

- **Teaching:** to education students to assume and continue professional and leadership roles in public health practice, policy, research, and teaching.
- **Research (basic and applied):** to advance knowledge and understanding of the biological, social, behavioral, environmental, and economic factors affecting the health status of the population.
- **Service and Professional Practice:** to provide broad-based technical assistance and consultation on public health issues in the public and private sectors at local, state, national, and international levels.

Departments and curricula at the school are:

- Biostatistics
- Environmental Sciences and Engineering
- Epidemiology
- Health Behavior and Health Education
- Health Policy and Administration
- Maternal and Child Health
- Nutrition
- Public Health Leadership Program

All have graduate degree programs, four of which are open to undergraduates.

Interdisciplinary programs that provide opportunities for students in education, service, and research include: Center for Health Promotion and Disease Prevention, Institute for Environmental Studies, Occupational Safety and Health Education Resource Center, Occupational Health Studies Program, Carolina Population Center, Injury Prevention Research Center, and the Cecil G. Sheps Center for Health Services Research.

Graduate academic degrees offered by the School of Public Health are the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.), and the graduate professional degrees are the Master of Science in Public Health (M.S.P.H.), the Master of Science in Environmental Engineering (M.S.E.E.), the Master of Public Health (M.P.H.), the Master of Healthcare Administration (M.H.A.), and the Doctor of Public Health (Dr.P.H.). All requirements for these degrees are administered by the faculty of the School of Public Health with the approval of the Administrative Board of the Graduate School.

**M.P.H. Program**

The program is designed to prepare students for positions that require a considerable breadth of knowledge of the whole field of public health but a lesser degree of specialization in one area. Students in this program may take nearly half of their courses outside of the major department or curriculum and undergo extensive field training if previous experience is not deemed sufficient by criteria set by the student's department or curriculum. Typically, Master of Public Health students already have acquired education in a health or health-related profession or have at least three years of experience in a field related to public health. The Master of Public Health degree is considered a terminal degree, but qualified students may proceed in the School of Public Health to a Dr.P.H. or Ph.D. program for advanced study.

**M.S.P.H. Program**

The Master of Science in Public Health program is designed to prepare students for professional careers in specialized areas of public health. Thus, students in this program will take courses mainly in one major department or curriculum of the School of Public Health. Additionally, there are core requirements that provide for orientation to a broader view of public health. The Master of Science in Public Health degree is usually a terminal degree, but it and the Master of Science degree, more so than the Master of Public Health, tend to be the precursor to a doctoral program. Programs of study leading to the M.S.P.H. degree are offered by the following departments: Environmental Sciences and Engineering, Epidemiology, Health Behavior and Health Education, Health Policy and Administration, and Maternal and Child Health.

**M.H.A. Program**

The Master of Health Care Administration program in the Department of Health Policy and Administration is designed to prepare students for management careers in health care organizations. Graduates will be prepared to take positions in staff or line management or as consultants in hospitals, health maintenance organizations, clinics, public health departments, and other health care settings.

**M.S. Degree**

Programs of study leading to this degree are offered in the departments of Biostatistics and Environmental Sciences and Engineering, and in the Public Health Leadership Program.

**M.S.E.E. Degree**

The curriculum leading to the M.S.E.E. degree is designed to prepare graduates for careers in the environmental engineering profession with special emphasis on water resources and air and industrial hygiene. Specifically, those awarded this degree are prepared for professional work with private
firms of consulting engineers, with public agencies at the national, state, regional, and local levels of government, and with a variety of industrial organizations.

**Executive Master's Program**

The Department of Health Policy and Administration provides graduate-level education to employed health professionals and health administrators through its Executive Master's Programs:

The North Carolina Program provides graduate education in health administration for North Carolina health professionals holding full-time jobs. This program offers classes one full day per week at several off-campus sites. Students complete the M.P.H. within three years and the M.H.A. requirements within four years.

The National Program provides master's degree study to full-time health professionals throughout the United States and beyond. This program is comprised of intensive summer institutes on the Chapel Hill campus, faculty-guided distance learning, and credit transfer from approved programs at other universities. Students usually complete the M.P.H. degree requirements within two years, and the M.H.A. in three.

**Dr.P.H. Program**

The Doctor of Public Health program provides professional training to prepare persons to effectively conduct or supervise research, usually of an applied nature, and the integration of new knowledge and techniques into community and/or public health practice. Graduates are typically employed by operating community or public health programs at the local, state, national, or international levels.

**Ph.D. Degree**

The Doctor of Philosophy degree prepares students for leadership in academic and related settings involving teaching and research with emphasis on basic or theoretical issues. Graduates are typically employed by universities or other organizations conducting research. This degree is offered in the departments of Biostatistics, Environmental Sciences and Engineering, Health Behavior and Health Education, Health Policy and Administration, Maternal and Child Health, and Nutrition. The precursor to the Ph.D. degree is typically the M.S.P.H. degree if the research is oriented to public health, or the M.S. degree if the research is not so oriented.

**Joint Degree Programs**

A number of joint degree programs are offered in select departments of the School of Public Health. Under the joint degree arrangement, a student may earn two professional degrees in a period of time less than the total required by the two degrees separately. Medical students may pursue a joint degree through the departments of Epidemiology, Health Policy and Administration, Maternal and Child Health, or Public Health Leadership. Dentistry, business, and law students may enroll in joint degree programs through the Department of Health Policy and Administration. A joint degree is also offered through the Department of Maternal and Child Health in conjunction with the School of Social Work.

**DEPARTMENT OF BIOSTATISTICS (BIOS)**

C. ED DAVIS, Chair

Lawrence L. Kupper, Associate Chair

**Professors**

Clarence E. Davi (27) Clinical Trials, Nonparametric Statistics, Cardiovascular Epidemiology

Joseph G. Ibrahim (11) Bayesian Model Selection, Prior Elicitation, Bayesian Computational Methods, Missing Data Problems, Survival Analysis, Longitudinal Data, Generalized Linear Models

William D. Kalbess (55) Sample Design, Survey Analysis, Nonparametric Tests

Alan F. Karr, Inference for Stochastic Processes, Image Analysis (Joint with Statistical)

Gary G. Koch (14) Categorical Data Analysis, Nonparametric Methods, Survival Analysis

Lawrence L. Kupper (19) Regression Analysis, Statistical Applications in Epidemiology and in Environmental Health

Danyu Lin (87) Survival Analysis, Semiparametric Statistical Methods, Clinical Trials

Purna K. Sen (10) Statistical Inference, Clinical Trials, Multivariate Analysis (Joint with Statistical

Chariyath M. Suchindran (29) Statistical Demography

Michael J. Symons (17) Consulting, Bayesian Applications, Statistical Education

Kinh N. Truong (90) Time Series Analysis, Nonparametric Regression, Bootstrap Methods, Hazard Regression, Splines

**Associate Professors**

Jiuwen Cai (93) Survival Analysis and Regression Models, Clinical Trials, Analysis of Correlated Responses

Lloyd J. Edwards (95) Longitudinal Data Analysis, Measurement Error Models, Clinical Trials

Keirr E. Muller (76) Linear and Nonlinear Repeated Measures Models, Study Design

Baha S. Hadi (94) Generalized Linear Models, Survival Analysis, Computing

Francois Sellier-Loisel (91) Predictive Inference, Analysis of Molecular Genetic Data, Empirical Bayes Methodology

Craig D. Turnbull (26) Public Health Statistics, Research on Perinatal Outcomes and Behavioral Sciences

Fred A. Wright (7) Statistical Genetics

**Assistant Professors**

Amy H. Herring (87) Survival Analysis, Missing Data Methods, Environmental Statistics

Anastasia Javanov (83) Clinical Trials Design, Sequential Design of Binary Response Experiments, Statistical Methodology in Biostatistics

Donglin Zeng (5) High Dimensional Data, Survival Analysis

Haitao Zhou (40) Missing/Auxiliary Data, Survival Analysis, Human Fertility

Fei Zou (4) Statistical Genetics

**Research Professors**


Lloyd E. Chambless (82) Epidemiological Applications, Analysis of Survey Data, Measurement Error

Robert M. Harter (28) Linear Models, Mixed Models, Clinical Trials

**Research Associate Professors**

Shrikant B. Bangdwalka (80) Nonparametric Methods, Clinical Trials Methodology, International Health, Injury Prevention

James D. Hecking (79) Data Management, Multivariate Techniques, Clinical Trials

Michael J. Schell (97) Monotonic Regression Analysis, Order Restricted Inference, Clinical Trials, Low-Dose Extrapolation

Paul W. Stewart (84) Linear Models, Distribution Theory, Statistical Inference, Longitudinal Data

**Research Assistant Professors**

HeeJeung Bang (8) Survival Data Analysis, Medical Cost Data Analysis

Diane Castelli (78) Linear Models, Missing Data, Clinical Trials

Yun-Feng Chiu (88) Statistical Genetics, Longitudinal Data Analysis, Regression Modeling and Epidemiological Methods

David J. Couper (77) Epidemiological Methods, Longitudinal Data, Data Quality

John S. Presler (83) Categorical Data, Longitudinal Data Analysis

Douglas J. Taylor (12) Child Development, Environmental Health Statistics, Sexually Transmitted Diseases, Repeated Measures Analysis
Clinical Assistant Professor
Gail E. Todor (66) Categorical Data, Survival Analysis

Research Instructors
Katherine J. Roggenkamp (3) Statistical Computing
Todd A. Schwartz (13) Categorical Data, Clinical Trials

Adjunct Professors
John P. Creason, Statistical Applications in Environmental Health, Dose-Response Methodology
Stephen D. Durham, Stochastic Processes, Dose-Response Methodology
Edward L. Frome, Statistical Computing and Biomedical Data Analysis
Harry A. Guess, Applications of Statistics to Medicine, Epidemiology, and Health Services Research
Joseph K. Haeeman, Statistical Methods in Environmental Health, Toxicology, and Cancer
Daniel G. Hervic, Sample Survey Design, Nonparametric Errors in Surveys
Norman L. Kaplan, Stochastic Processes, Statistical Genetics
Lisa M. LaVange, Sampling Design, Longitudinal Data Analysis
Judith T. Lesesne, Sampling
Andrew S. Lunde, Demography, Vital Statistics, Health Statistics, Social Statistics
Herman E. Mitchell, Clinical Trials, Health Care Research, Clinical Epidemiology
Walter W. Pieper, Genetics, Toxicity Assays, and Environmental Statistics
W. Kenneth Poole, Clinical Trials, Statistical Research Administration
Christopher J. Porter, Design and Analysis of Environmental Health Research Studies
Donald W. Reinert, Design, Applications in Highway Safety and Injury Prevention
Ibrahim A. Salama (38) Nonparametric Statistics, Order Statistics, Ergodic Theory
Bibhutibhushan B. Shah (49) Survey Data Analysis Software, Multivariate Data Analysis, and Quality Assurance
Clarice R. Weinberg, Statistical Methods in Epidemiology and in Environmental Health, Reproductive Epidemiology

Adjunct Associate Professors
Kerrie E. Boyle, Demographic Models, Survey Statistics
Margaret R. Burchinal, Longitudinal Data Analysis, Mixed Models, Child Development Research
Sandra B. Greene, Health Services Applications
Grace E. Kisting Statistic Consulting, Empirical Bayes Estimation, Logistic Regression
Kerry L. Lee (52) Multivariate Analysis, Clinical Trials, Regression Modeling Strategies for Survival and Risk Analysis
Katherine L. Monti, Clinical Trials, Mixed Models
Timothy M. Morgan, Clinical Trials, Survival Analysis, Cancer Statistical Methods
R. Woodrow Secker, Environmental Statistics, Risk Assessment, Toxicology
Steven M. Snapinn, Statistics in the Pharmaceutical Industry
Maura E. Stokes, Categorical Data Analysis
Donald C. Tost, Statistics in the Pharmaceutical Industry, Statistical Genomics, Multivariate Analysis

Adjunct Assistant Professors
Ingrid A. Amara, Categorical Data Methods in Psychiatry
Delron M. Atkinson, Public Health Statistics
J. Michael Bowling, Survey Methodology, Evaluation, Injury Prevention
Sonia M. Davis, Bioequivalence, Statistics in the Pharmaceutical Industry
Ralph B. D’Agostino, Measurement Error, Clinical Trials, Statistical Genetics
Elizabeth R. DeLong, Clinical Trials, Case Control Studies and Evaluation of Diagnostic Tests
Ralph A. DeMasi, Statistical Methodology
Priscilla A. Guild, Health Services Planning and Evaluation Research
Kerry B. Hafner, Statistics in the Pharmaceutical Industry, Design and Analyses of Crossover Trials, Repeated Measures Designs
Cindy P. Lawler, Experimental Design and Statistical Methods for Basic Biomedical Sciences

Robert H. Lyles, Environmental Statistics, Measurement Error Models, Statistical Methods in Epidemiology
Henry S. Lynn, Statistical Methods in Clinical Epidemiology, Clinical Trials
Marjolein V. Smith, Biometrics
Dalene K. Stangl, Bayesian Statistics, Survival Analysis
Sandra S. Stinn, Statistical Consulting and Education, Epidemiologic Methods
Lisa Tomasko, Longitudinal Data, Clinical Trials, Experimental Design, Missing Data
Russell D. Wolfinbarger, Statistical Computation

Professors Emeriti
James R. Abernathy
Elizabeh J. Coulter
Regina C. Elkins-Johnson
James E. Grizzle
Ronald W. Helms
Barry H. Margolin
Dana E. Quade
Richard H. Shachtmann
H. Bradley Wells

Courses
101 FUNDAMENTALS OF BIOSTATISTICS (3). Introduction to procedures in collection, summarization, analysis, and presentation of data. Topics include sampling, experimentation, measurement, descriptive statistics, probability, confidence intervals, and tests of hypotheses. Fall. Quade and Symons.


110 PRINCIPLES OF STATISTICAL INFERENCE (3). Prerequisite, knowledge of basic descriptive statistics. Major topics include elementary probability theory, probability distributions, estimation, tests of hypotheses, chi-squared procedures, regression, and correlation. Fall and spring. Harner, Tudor, Turnbull.

111 INTRODUCTION TO STATISTICAL COMPUTING AND DATA MANAGEMENT (3). Prerequisite, Biostatistics 101 or equivalent. Introduction to use of computers to process and analyze data, components of digital computers, characteristics of magnetic storage devices, use of JCL and utility programs, concepts and techniques of research data management, use of statistical program packages and interpretation. Fall. Staff.

120 SPECIAL TECHNIQUES IN BIOMETRY (1-3). Special topics of current interest in biometry. Fall, spring, and summer. On demand. Staff.

124 SOME QUANTITATIVE METHODS IN PLANNING AND EVALUATION (3). Prerequisite, Biostatistics 101 or equivalent or permission of the instructor. Planning cycle, methods overview, data sources, PERT, budgeting, health indices, measurement of goal fulfillment, achievement, effectiveness, efficiency, research designs, benefit cost analysis, decision analysis, probability, utility, and decision trees. On demand. Staff.

130 RESEARCH ISSUES IN MENTAL HEALTH STATISTICS (3). Prerequisites, Biostatistics 110 and Epidemiology 160, or permission of the instructor. Concepts of measurement, history, and current status of classification schemes for mental disorders, methods of data analysis, and research designs. On demand. Turnbull.

140 PROBLEMS IN BIOSTATISTICS (1 or more). Prerequisites to be arranged with the faculty in each case. A course for students of public health who wish to make a study of some special problem in the statistics of the life sciences and public health. Fall, spring, and summer. Staff.
141 QUANTITATIVE METHODS FOR HEALTH CARE PROFESSIONALS I (3). Prerequisite: permission of instructor. Course is designed to meet the needs of health care professionals who need to be able to critically appraise the design and analysis of medical and health care studies and intend to pursue academic research careers. Basics of statistical inference, analysis of variance, multiple regression, categorical data analysis, and an introduction to logistic regression and survival analysis. Emphasis is on applied data analysis of major health care studies. Fall. Garrett.

142 QUANTITATIVE METHODS FOR HEALTH CARE PROFESSIONALS II (3). Prerequisites: Biostatistics 141 and permission of instructor. Continuation of Biostatistics 141; main emphasis is on logistic regression; other topics include exploratory data analysis and survival analysis. Spring. Garrett.

145 PRINCIPLES OF EXPERIMENTAL ANALYSIS (3). Prerequisites, Biostatistics 110 or equivalent; a basic familiarity with a statistical software package (preferably SAS) that has the capacity to do multiple linear regression analysis; permission of the instructor except for majors in School of Public Health. Continuation of Biostatistics 110; the analysis of experimental and observational data, including multiple regression, and analysis of variance and covariance. Fall and spring. Staff.

150 BASIC ELEMENTS OF PROBABILITY AND STATISTICAL INFERENCE I (Genetics 150, 3). Prerequisite, Mathematics 32 or equivalent. Fundamentals of probability, discrete and continuous distributions; functions of random variables; descriptive statistics; fundamentals of statistical inference, including estimation and hypothesis testing. Fall. Staff.

151 BASIC ELEMENTS OF PROBABILITY AND STATISTICAL INFERENCE II (3). Prerequisites, Biostatistics 150 or equivalent, a basic familiarity with a statistical software package (preferably SAS) that has the capacity to do multiple linear regression analysis; or permission of the instructor. The theory and application of multiple linear regression and related analysis of variance (ANOVA) methods. The theory and application of maximum likelihood-based modeling methods, including logistic regression and Poisson regression. Spring. Staff.

160 PROBABILITY AND STATISTICAL INFERENCE I (3). Prerequisite, Mathematics 33 or equivalent. Introduction to probability; discrete and continuous random variables; expectation theory; bivariate and multivariate distribution theory; regression and correlation; linear functions of random variables; theory of sampling; introduction to estimation and hypothesis testing. Fall. Ivanova.

161 PROBABILITY AND STATISTICAL INFERENCE II (3). Prerequisite, Biostatistics 160. Distribution of functions of random variables; Helmert transformation theory; central limit theorem and other asymptotic theory; estimation theory; maximum likelihood methods; hypothesis testing; power; Neyman-Pearson theorem. Likelihood ratio, score, and Wald tests; noncentral distributions. Spring. Kupper.

162 INTERMEDIATE STATISTICAL METHODS (4). Corequisites, Biostatistics 111, 156, or equivalents. Principles of study design, descriptive statistics, and sampling from finite and infinite populations, with particular attention to inferences about location and scale for one, two, or k sample situations. Both distribution-free and parametric approaches are considered. Gaussian, binomial, and Poisson models, one-way and two-way contingency tables, as well as related measures of association, are treated. Fall. Staff.

163 INTERMEDIATE LINEAR MODELS (4). Prerequisite, Biostatistics 162 or equivalent. Matrix-based treatment of regression, one-way and two-way ANOVA, and ANCOVA, emphasizing the general linear model and hypothesis, as well as diagnostics and model building. The course begins with a review of matrix algebra and it concludes with some treatment of statistical power for the linear model and with binary response regression methods. Spring. Staff.

164 SAMPLE SURVEY METHODOLOGY (Statistics 104) (3). Prerequisite, Biostatistics 150 or equivalent or permission of the instructor. Fundamental principles and methods of sampling populations, with primary attention given to simple random sampling, stratified sampling, and cluster sampling. Also, the calculation of sample weights, dealing with sources of nonsampling error, and analysis of data from complex sample designs are covered. Practical experience in sampling is provided by student participation in the design, execution, and analysis of a sampling project. Spring. Kalibek.

165 ANALYSIS OF CATEGORICAL DATA (3). Prerequisites, Biostatistics 145, 150, and 162, or permission of the instructor. Introduction to the analysis of categorized data: rates, ratios, and proportions; relative risk and odds ratio; Cochran-Mantel-Haenszel procedure; survivorship and life table methods; linear models for categorical data. Applications in demography, epidemiology, and medicine. Fall. Koch.

166 APPLIED MULTIVARIATE ANALYSIS (Statistics 169) (3). Prerequisite, Biostatistics 163 or equivalent. Application of multivariate techniques, with emphasis on the use of computer programs. Multivariate analysis of variance, multivariate multiple regression, weighted least squares, principal component analysis, canonical correlation and related techniques. On demand. Mulzer.

167 APPLIED STOCHASTIC PROCESSES (3). Prerequisite, Biostatistics 161 or equivalent. Markov chains, Poisson processes and extensions, epidemic models, branching processes and other stochastic models of empirical processes. Disease, population, and other biostatistical applications. Spring. Zhou.

168 DESIGN OF PUBLIC HEALTH STUDIES (3). Prerequisites, Biostatistics 145, 150, or equivalents. Statistical concepts in basic public health study designs: cross-sectional, case-control, prospective, and experimental (including clinical trials). Validity, measurement of response, sample size determination, matching and random allocation methods. Spring. Staff.

170 DEMOGRAPHIC TECHNIQUES I (3). Prerequisite, Biostatistics 101 or equivalent. Source and interpretation of demographic data: rates and ratios, standardization, complete and abridged life tables; estimation and projection of fertility, mortality, migration, and population composition. Fall. Suchindran, Billborow.

180 INTRODUCTORY SURVIVORSHIP ANALYSIS (3). Prerequisite, Biostatistics 161 or permission of the instructor. Introduction to concepts and techniques used in the analysis of time to event data, including censoring, hazard rates, estimation of survival curves, regression techniques, applications to clinical trials. Spring. Cai.

191 FIELD OBSERVATIONS IN BIOSTATISTICS (1). Field visits to, and evaluation of, major nonacademic biostatistical programs in the Research Triangle area. (Field fee $25.) Fall. Turnbull.

213 DATA MANAGEMENT IN BIOSTATISTICS (3). Prerequisite, Biostatistics 111 or equivalent. Techniques for designing, implementing, and operating computerized data management systems for large studies with particular emphasis on collaborative medical studies. Experience in programming in a procedural language (PL-1, FORTRAN, C, BASIC, etc.) is assumed. On demand. Hosking.

215 HEALTH DATA PROCESSING LABORATORY (1-3). Prerequisite, Biostatistics 213. A laboratory course for students who wish to gain experience in the data processing aspects of current projects and collaborative medical studies of the department. (On demand.) Hosking.

231 BAYESIAN STATISTICS (3). Prerequisite, Biostatistics 262 or equivalent. Basic aspects of the Bayesian paradigm including Bayes' theorem, the likelihood principle, prior distributions, posterior distributions, and predictive distributions. Bayesian analysis of linear models, generalized linear models, random effects models, spatial models, and survival models. Informative prior elicitation, model comparisons, Bayesian diagnostic methods, and variable subset selection. Markov Chain Monte Carlo methods for computations. Bayesian methods for the design and analysis of clinical trials. Fall. Ibrahim.

235 STATISTICAL COMPUTING - BASIC PRINCIPLES AND APPLICATIONS (3). Prerequisites, Biostatistics 161; familiarity with at least one computer system and with either a computer language (C, FORTRAN, etc.) or a computer package (SAS, SPSS, etc.). Basic theory and application of computing as a tool in statistical research and practice. Topics include: algorithms and data structures, im-
ear and nonlinear systems, function approximation, numerical integration, the EM algorithm, simulation, and document preparation. Spring, Fall, and Summer. Staff.

240 SPECIALIZED METHODS IN HEALTH STATISTICS (1 or more). Prerequisite: permission of the instructor. Statistical theory applied to special problem areas of timely importance in the life sciences and public health. Lectures, seminars, and/or laboratory work, according to the nature of the special area under study. Fall, Spring, and Summer. Staff.

250 ADVANCED TECHNIQUES IN BIOMETRY (4-4). Prerequisite: Biostatistics 161, 163, or equivalent. Permission of the instructor. Up to three or four separate one-semester-hour modules presenting advanced techniques in biometry (topics covered usually vary at each offering). A knowledge of elementary computer programming is assumed. Fall, Spring, and Summer. Staff.

256 INTRODUCTION TO NONPARAMETRIC STATISTICS (Statistics 171) (3). Prerequisite: Biostatistics 161 or equivalent. Theory and application of nonparametric methods for various problems in statistical analysis. Includes procedures based on randomization, ranks, and U-statistics. A knowledge of elementary computer programming is assumed. On demand. Staff.

257 NONPARAMETRIC PROCEDURES IN BIOMETRIC RESEARCH (3). Prerequisite: Biostatistics 256 or equivalent. Nonparametric point and interval estimation in linear models useful in biometric research. Robust procedures, including those based on ranks, for analyzing designed experiments, bioassays, and clinical trials. On demand. Staff.

259 APPLIED TIME SERIES ANALYSIS (3). Prerequisites: Biostatistics 161 and 163 or equivalent, and permission of the instructor. Topics include correlograms, periodograms, fast Fourier transforms, power spectra, cross-spectra, coherences, ARMA and transfer-function models, spectral-domain regression. Real and simulated data sets are discussed and analyzed using popular computer software packages. Spring, Summer.

260 ADVANCED PROBABILITY AND STATISTICAL INFERENCE I (3). Prerequisite: Biostatistics 161 or permission of the instructor. Generating and characteristic functions; discrete and continuous distributions; basic estimation theory; basic hypothesis testing theory; sampling distributions; probability inequalities; laws of large numbers; martingales and reversed martingales; stochastic convergence; central limit theorems; large sample theory for least squares estimation and maximum likelihood estimation; large sample theory for likelihood ratio tests; and introduction to methods for categorical data and generalized linear models. Fall. Staff.

261 ADVANCED PROBABILITY AND STATISTICAL INFERENCE II (3). Prerequisite: Biostatistics 260 or permission of the instructor. Unbiasedness, consistency, sufficiency, and efficiency properties. Invariance, completeness, admissibility, ancillarity, minimaxity, and equivariance properties. Unbiased and locally most powerful tests (including the multiparameter case). Envelope power function; best average power test. Bayes and empirical Bayes procedures. Likelihood, quasi-likelihood, and profile likelihood. Order statistics and empirical distributions; general central limit theorems; variance stabilizing transformations; U-statistics; least squares, weighted least squares, and generalized least squares estimation. Generalized estimating equations; asymptotic theory for BAN estimators; asymptotic theory for likelihood ratio, Wald, and score tests; log-linear models; asymptotics for linear inference; robust statistical inference. Spring. Staff.

262 ADVANCED LINEAR MODELS I (4). Prerequisites: Biostatistics 161 and 163, Mathematics 147, Mathematics 116 or 137. Theory and methods for continuous response models. Topics include matrix theory, the multivariate normal distribution, multivariate quadratic forms, estimability, reparameterization, linear restrictions and splines, estimation theory, weighted least squares, multivariate tests of linear hypotheses, multiple comparisons, confidence regions, prediction intervals, statistical power, mixed models, transformations and diagnostics, growth curve models, dose-response models, missing data. Fall. Muller and Stewart.

263 GENERALIZED LINEAR MODEL THEORY AND APPLICATIONS (4). Prerequisite: Biostatistics 262. Introduction to the theory and applications of generalized linear models, quasi-likelihoods, and generalized estimating equations. Topics include logistic regression, over-dispersion, Poisson regression, log-linear models, conditional likelihood, multivariate regression models, generalized mixed models, and regression diagnostics. Fall. Staff.

264 ADVANCED SURVEY SAMPLING METHODS (3). Prerequisite: Biostatistics 164 or equivalent. Continuation of Biostatistics 164 for advanced students: stratification, special designs, multistage sampling, cost studies, non-sampling errors, complex survey designs, employing auxiliary information, and other miscellaneous topics. On demand. Staff.

265 LINEAR MODELS IN CATEGORICAL DATA ANALYSIS (3). Prerequisite: Biostatistics 161, 163, 165, and 166 or equivalent. Theory of statistical methods for analyzing categorical data by means of linear models; multifactor and multiresponse situations; interpretation of interactions. Spring. Staff.

267 ADVANCED LINEAR MODELS II (4). Prerequisite: Biostatistics 262. Theory and methods of linear statistical models for continuous response data, including definitions of parameters, hypotheses, isomorphic models, orthogonal polynomials, incomplete/informative censored data; general linear univariate, multivariate, and mixed (random effects) models and parameterizations for various classes of designed experiments and longitudinal studies; modeling covariance structures. Spring. Staff.

268 SPECIALIZED ADVANCED TOPICS IN STATISTICAL MODELING (3). Prerequisites: Biostatistics 262 and 263. Missing data; errors-in-variables; linear and non-linear mixed and random effects models; advanced methods for categorical data; advanced applications of estimating function theory; detailed treatment of GEE-I and GEE-II methods; Bartlett and other corrections in GLMs; nonparametric regression methods; data smoothing; generalized additive models. On demand. Staff.

271 DEMOGRAPHIC TECHNIQUES II (3). Prerequisites: Biostatistics 170 and integral calculus. Life table technique; methods of analysis when data are deficient; population projection methods; interrelations among demographic variables; migration analysis; uses of population models. Spring. Staff.

277 MATHEMATICAL MODELS IN DEMOGRAPHY (3). Prerequisite: permission of the instructor. A detailed presentation of mortality models, including necessary mathematical methods, and applications; deterministic and stochastic models for population growth, migration. Fall. (2000 and alternate years.) Staff.


281 STATISTICAL METHODS IN HUMAN GENETICS (GNET 281) (3). Prerequisites: Biostatistics 161 and 163 or permission of the instructor. An introduction to statistical procedures in human genetics, Hardy-Weinberg equilibrium, linkage analysis (including use of genetic software packages), linkage disequilibrium and allelic association. Fall. Staff.

283 STATISTICAL METHODS IN QUANTITATIVE GENETICS (3). Prerequisites: Biostatistics 161 and 163 or permission of the instructor. An introduction to the statistical basis of variation in quantitative traits, with focus on experimental crosses and decomposition of trait variation, linkage map construction, statistical methodologies and computer software for mapping quantitative trait loci. Issues involving whole genome analysis will be highlighted. Spring. Staff.

341 PRINCIPLES OF STATISTICAL CONSULTING (1). Prerequisite: Biostatistics 145 or equivalent and permission of the instructor except for majors in the department. An introduction to the statistical consulting process, emphasizing its non-technical aspects. Spring. Staff.

342 PRACTICE IN STATISTICAL CONSULTING (1-3). Prerequisites: Biostatistics 111, 145, 150, 341, or equivalents, and permission of the instructor. Under supervision of a faculty member, the student interacts with research workers in the health sciences, learning to abstract the statistical aspects of substantive prob-
350 TRAINING IN STATISTICAL TEACHING IN THE HEALTH SCIENCES (2 or more). Prerequisite, a minimum of one year of graduate work in statistics. Principles of statistical pedagogy. Students assist with teaching elementary statistics to students in the health sciences. Students work under the supervision of the faculty, with whom they have regular discussions of methods, content, and evaluation of performance. Fall, spring, and summer. Staff.

389 RESEARCH SEMINAR IN BIOSTATISTICS (1-3). Prerequisite, permission of the instructor. Seminar on new research developments in selected biostatistical topics. Fall and spring. Staff.

390 RESEARCH IN BIOSTATISTICS (2 or more). Individual arrangements may be made by the advanced student to spend part or all of his or her time in supervised investigation of selected problems in statistics. Fall, spring, and summer. Staff.

392 MASTER’S PAPER (3 or more). Fall, spring, and summer. Staff.

393 MASTER’S THESIS (3 or more). Fall, spring, and summer. Staff.

394 DOCTORAL DISSERTATION (Minimum of 3). Fall, spring, and summer. Staff.

DEPARTMENT OF ENVIRONMENTAL SCIENCES AND ENGINEERING (ENVR)

CASS T. MILLER, Chair

Professors
Michael D. Aiken (66) Wastewater and Hazardous Waste Treatment, Applied Biotechnology
Richard N. L. Andrews (50) Environmental Policy
Louise M. Ball (62) Metabolism, Toxicology and Genotoxicity of Xenobiotics
John M. Bane Jr., Marine Sciences
George Christakos (79) Applied Mathematics in Water Resources Engineering, Stochastic Modeling
Douglas J. Crawford-Brown (54) Environmental Risk Analysis, Mathematical Modeling of Human Health Effects
Francis A. DiGiano (51) Water and Wastewater Treatment Processes, Mathematical Modeling of Mass Transport
Michael R. Flynn (61) Relationship between Exposure and the Capture Efficiency of Local Exhaust Hoods, Computer-Aided Optimization of Ventilation Systems
Donald L. Fox (8) Atmospheric Chemistry, Aerosols
William H. Glaize (72) Environmental Sciences and Engineering
Avram Gold (43) Environmental Toxicology
Milton S. Heath Jr. (39) Natural Resource Law
Harvey E. Jeffries (14) Atmospheric Chemistry, Modeling and Computerized Data Acquisition
Richard M. Kamens (55) Atmospheric Gas-Particle Partitioning of Semivolatile Toxic Organics; Reactions of Atmospheric PAH and Other Organic Toxics; Modeling Biogenic Aerosol Formation from Gas Phase Reactions
Donald T. Lauria (18) Water and Wastewater Systems Analysis, Mathematical Modeling
David Leith (56) Air Pollution Control Engineering, Aerosol Technology
Richard A. Luetich, Marine Sciences, Physics of Shallow Water Bodies
Christopher S. Martens, Marine Sciences
David H. Moreau (48) Water Resources Planning
Hans W. Parel (65) Environmental Microbial Ecology
Frederic K. Pfenning (25) Environmental Microbiology
Stephen M. Rappaport (76) Exposure Assessment, Industrial Hygiene
Parker C. Reist (26) Aerosol Technology, Industrial Hygiene Engineering
Philip C. Singer (31) Water and Wastewater Treatment Processes, Aquatic Chemistry
Mark D. Sobsey (38) Environmental Microbiology, Virology, Toxicology
James A. Swenberg (77) Environmental Toxicology, Chemical Carcinogenesis
James E. Watson Jr. (37) Radiological Hygiene
Robert G. Werfel (99) Limnology
Dale Whitington (70) Water Resources Economics, International Development

Associate Professors
Lori A. Todd (75) Application of Computer Tomography and Optical Remote Sensing for Sampling and Evaluating Gases in Workplace Air
Steven C. Whalen (93) Ecology, Limnology

Assistant Professors
Gregory W. Chiraclakis (98) Water Resources
Leena Nylander-French (95) Environmental Health Sciences

Clinical Professors
Donald E. Francisco (9) Limnology and Aquatic Microbial Ecology
Frances M. Lynn (67) Environmental Risk Assessment, Communication of Scientific and Technological Information, Sociology of Science

Research Assistant Professors
Theresa L. Cromeans, Microbiology
Markus Hilpert, Environmental Modeling
Jua Nakamura, Environmental Toxicology
Ramiah Sangaiah (90) Chemical Synthesis
Marc Serre, Environmental Modeling
Gwy-AM Shin, Water and Wastewater Disinfection
Howard S. Weinberg (96) Aquatic Chemistry

Adjunct Professors
Francis S. Binkowski, Air Quality, Meteorology
Linda S. Birnbaum (86) Xenotrophic Metabolism, Biochemical Toxicology
David S. Ensor (80) Aerosol Science
J. Ronald Has (64) Environmental Chemistry
Joellen Lewtas, Generic Biosays
Paul W. Premdville, Water and Wastewater Treatment Plant Design
Donald A. Tyndall, Radiation Biology
Barbara T. Walton, Ecotoxicology, Bioremediation, Biomonitoring
William E. Wilson, Aerosols, Photochemistry, Smog Chambers

Adjunct Associate Professors
Philip W. Albright (58) Environmental Chemistry
Michael A. Berry, Program and Research Management, Environmental Legislation, Health Assessment, Indoor Air Pollution
Nelson W. Couch, Radiological Hygiene
Larry D. Claxton, Mutagens in Testing, Biochemical Chemistry
Daniel L. Costa (97) Pulmonary Toxicology
David DeMarini (81) Generic Toxicology
John M. Dement (60) Industrial Hygiene
Philip E. Hamrick, Radiological Hygiene
John L. S. Hickey (45) Industrial Hygiene Engineering, Industrial Ventilation
R. Timothy Hitchcock, Physical Agents
Linda W. Little, Bioassay Procedures
Joseph Pinto (82) Atmospheric Modeling

Adjunct Assistant Professors
Deborah A. L. Amara, Risk Analysis
Gaylen R. Brubaker, Bioremediation
Jane Gallagher, Environmental Toxicology
M. Ian Gilmour, Immunotoxicology
Michael C. Madden, Ozone Reactions with Biomolecules
Rachel T. Noble, Marine Sciences
Daniel L. Norwood, Environmental Analytical Chemistry, Mass Spectrometry
Andrew V. Perkash, Water and Wastewater Treatment Plant Design
Terrence K. Pierson, Environmental Risk Assessment
Jane Ellen Simmons (91) Hepatic and Renal Toxicology
Thomas B. Starr, Risk Assessment
Woodall Stopford, Occupational Medicine Physics
David B. Washburn, Diagnostic Radiation
Russell W. Wiener (83) Indoor Air Quality, Aerosol Monitoring

**Adjunct Instructor**
Bobby M. Wilson, Health Physics, Radiological Hygiene, Environmental Radiation, Emergency Response and Program Management

**Adjunct Lecturer**
Raymond W. Hackney, Industrial Hygiene

**Professors Emeriti**
Robert L. Harris
J. Donald Johnson
James E. Lamb Jr.
Daniel A. Okun
Morriss A. Shiffman
Mark S. Shuman
Charles Manuel Weiss
Ted M. Williams

**Courses**

100 READING IN ENVIRONMENTAL SCIENCES AND ENGINEERING (1-6). Prerequisite, permission required for students outside the department. Extensive reading study of a specific subject in environmental sciences and engineering. The subject and requirements of the project are arranged with the faculty in each instance. Fall, spring, and summer. Staff.


103 SEMINAR SERIES (1). Presents the results of ongoing research projects in the Department of Environmental Sciences and Engineering. Topics and presenters are selected from among the departmental graduate students and faculty. Fall, spring, summer. Staff.

104 UNIFYING CONCEPTS (3). Unifying concepts of environmental systems, including conservation principles, modeling, economics, and policy with applications from throughout natural, engineered, human systems. Interfaces among scientific, engineering, and policy aspects of the field. Fall. Miller.

105 PROBLEM BASED LEARNING (2). Prerequisite, permission of instructor. A problem common to the field of environmental science will be studied in detail through the use of small groups of students from the various disciplinary areas in the department. Staff.

110 ENVIRONMENTAL CHEMISTRY PROCESSES (Carolina Environmental Programs 110) (3). Prerequisites, a background in chemistry and mathematics, including ordinary differential equations. Chemical processes occurring in natural and engineered systems: chemical cycles; transport and transformation processes of chemicals in air, water and multimedia environments; chemical dynamics; thermodynamics; structure/activity relationships. Fall. Glaze.

111 LABORATORY TECHNIQUES AND FIELD MEASUREMENTS (3). Learn laboratory, field, analytical thought, and management skills. Students can choose applications in limnology, aquatic chemistry, and industrial hygiene. Fall. Nylander-French, Weinberg, Whalen.

112 ECOLOGICAL MICROBIOLOGY (3). Prerequisite, one course in general microbiology. A description of microbial populations and communities, the environmental processes they influence, and how they can be controlled to the benefit of humankind. Spring. Pfender.

113 LIMNOLOGY (3). Prerequisites, introductory biology, chemistry, and physics. Basic aspects of freshwater ecosystem function. Emphasis on trophic level interactions and integration of physical, chemical, and biological principles for a holistic view of lake ecosystem dynamics. Three lecture hours per week. Fall. Whalen.

114 ECOLOGY OF WETLANDS (Marine Sciences 137) (4). Prerequisites, one year of biology, one year of chemistry, one semester of ecology, and permission of instructor. An introduction to the functioning of freshwater and estuarine marsh and swamp ecosystems, with emphasis on systems of the southeastern U.S. Fall. Staff.

115 MARINE BIOGEOCHEMISTRY (Marine Sciences 119) (3). Prerequisites, one year biology plus organic and/or physical chemistry or one of Marine Sciences 101, Geology 164, Environmental Sciences and Engineering 119, or permission of the instructor is required. (Note: Advanced graduate students should consider Marine Sciences 140.) Integrated application of biological and chemical concepts to understand the processes controlling the cycling of carbon, nutrients, and biotic trace elements in seawater and marine sediments. Fall 2002 and alternate years. Annoti.

116 INTRODUCTION TO AEROSOL SCIENCE (4). Prerequisites, admission to the Department of Environmental Sciences and Engineering or permission of the instructor. Physical and chemical principles underlying behavior of particles suspended in air. Topics include rectilinear and curvilinear motion of the particles in a force field, diffusion, evaporation, and condensation, electrical and optical properties and particle coagulation, as well as the behavior of the cloud in toto. Three lecture hours and two lab hours a week. Fall (even-numbered years). Leith.

116L AEROSOL SCIENCE LABORATORY (2). Prerequisite or corequisite, Environmental Sciences 145. Basic laboratory exercises in aerosol sciences. Fall (alternate years). Reist.

117 OCEANOGRAPHY (Biology 126, Marine Sciences 101, Geology 101) (3). Prerequisites, major in a natural science or at least two college-level courses in natural sciences. The origin of ocean basins, chemistry and dynamics of seawater, biological communities and processes, the sedimentary record, and the history of oceanography. Term paper. Intended for students with college science background; other students should see Geography 12. Three lecture hours a week. Fall and spring. Staff.

118 CHEMICAL OCEANOGRAPHY (Marine Sciences 105) (4). Prerequisite, one semester of physical chemistry or Environmental Sciences 119 or Chemistry 180, or permission of instructor. Variation and abundance of sea water constituents, the chemical, physical, and biological processes contributing to their distribution, as well as problems of dispersion of conservative and nonconservative substances. Three lecture and two recitation hours a week. Spring. Martens, Annoti, Alperin.

119 CHEMICAL EQUILIBRIA IN NATURAL WATERS (3). Principles and applications of chemical equilibria to natural waters. Acid-base, solubility, complex formation, and redox reactions are discussed. This course uses a problem-solving approach to illustrate chemical speciation and environmental implications. Three lecture hours per week. Fall. Singer.

120 BIOLOGICAL OCEANOGRAPHY (Biology 140, Marine Sciences 104) (4). Prerequisite, Biology 54 or 105 or permission of instructor. Physical, chemical, and biological factors characterizing estuarine and marine environments emphasizing factors controlling animal and plant populations, including methods of analysis, sampling, and identification. Spring. Lindquist.

130 HEALTH EFFECTS OF ENVIRONMENTAL AGENTS (3). Prerequisites, basic biology, chemistry through organic, math through calculus; permission of the instructor if prerequisites not met. Interactions of environmental agents (chemicals, infectious organisms, radiation) with biological systems including humans, with particular attention to routes of entry, distribution, metabolism, elimination, and mechanisms of adverse effects. Three lecture hours per week. Fall. Ball and Sotkay.

131 TECHNIQUES IN ENVIRONMENTAL HEALTH SCIENCES (1). Prerequisites, basic biology, chemistry through organic, math through calculus, permission of the instructor if prerequisites not met. A practical introduction to the measurement of biological endpoints, emphasizing adverse effects of environmental agents, using laboratory and field techniques. Two laboratory hours per week. Fall. Ball and Sotkay.

132 BIOCHEMICAL TOXICOLOGY (Biochemistry 142, Toxicology 142) (3). Prerequisites, Chemistry 130 plus one course in biochemistry; permission of the instructor if prerequisites not met. Biochemical actions of toxins, and assessment...
of cellular damage by biochemical measurements. Three lecture hours per week.
Spring, Holbrook.

133 ENVIRONMENTAL HEALTH MICROBIOLOGY (3). Prerequisite, introductory course in microbiology or permission of the instructor. Presentation of the microbes of public health importance in water, food, and air, including their detection, occurrence, transport, and survival in the environment; epidemiology and risks from environmental exposure. Two lecture and two laboratory hours per week. Spring, odd-numbered years. Sobsey.

134 AIR AND INDUSTRIAL HYGIENE (3). Problem definition, sources of information, health effects, legislative framework, and control methods for chemical, physical, and biological hazards. Recognition, evaluation, and remediation of hazards associated with community and industrial environments. Three lecture hours per week. Fall. Fox, Todd.

135 INDUSTRIAL TOXICOLOGY (2). Toxicological assessment of and a case presentation of related exposure is given. A conceptual approach is utilized to design appropriate programs to prevent worker ill health due to industrial toxicant exposure. Two lecture hours per week. Spring. Staff.

136 RADIATION HAZARDS EVALUATION I (3). Prerequisite, calculus. The physics of ionizing radiations and the principles of radiation dosimetry, hazards evaluation, and protection are presented. Three lecture hours per week. Spring. Staff.

137 OCCUPATIONAL SAFETY AND ERGONOMICS (Public Health Nursing 286) (3). Fundamentals of occupational safety and ergonomics with emphasis on legislation and organization of industrial safety and ergonomic programs, including hazard recognition, analysis, control, and motivational factors pertaining to industrial accident and cumulative trauma disorder prevention. Fall. Staff.

138 HEALTH HAZARDS OF INDUSTRIAL OPERATION (3). Prerequisite, Environmental Sciences 134. An introduction to the health hazards associated with the various unit operations of industrial field trips to local industries planned. Spring. Flynn.

139 THEORY AND PRACTICE OF EXPOSURE EVALUATION (3). Prerequisites, Environmental Sciences and Engineering 143 and 145. Methodology and philosophy of evaluating exposures to air contaminants in the workplace. Course is divided into lectures, case study analyses, and hands-on term project. Three lecture hours per week. Spring. Todd.

150 PRINCIPLES AND APPLICATIONS OF ENVIRONMENTAL ENGINEERING (3). Principles that govern the behavior of contaminants in air and water. Application of these principles to engineered processes that control air and water quality. Three lecture hours per week. Spring. Singer and Leith.

151 PROCESS DYNAMICS IN ENVIRONMENTAL SYSTEMS (3). Prerequisites, Math 124 or equivalent, permission of the instructor. Application of fluid transport, mass transfer, and chemical reactor principles to describe important processes in water/wastewater treatment, air pollution control, and natural systems. Three lecture hours per week. Fall. DiGiano.

152 FLUID DYNAMICS (Geology 181, Marine Sciences 151, Physics 151) (3). Prerequisites, Physics 103 or permission. The physical properties of fluids, kinematics, governing equations, viscous incompressible flow, vorticity dynamics, boundary layers, irrotational incompressible flow. Three lecture hours per week. Spring. Scarinci.

153 GROUNDWATER HYDROLOGY (3). Prerequisites, math through differential equations and some familiarity with fluid mechanics. Conservation principles for mass, momentum, and energy developed and applied to groundwater systems. Scope includes the movement of water, gas, and organic liquid phases, the transport and reaction of contaminants. Three lecture hours per week. Fall. Miller.

154 MARINE SYSTEMS MODELING (Geology 141, Marine Sciences 152) (3). Prerequisites, Math 32 or permission of instructor. Mathematical modeling of the dynamic system, linear and nonlinear. The fundamental budget equation. Case studies in modeling convective transport, biogeochemical process, population dynamics. Analytical and numerical techniques, chaos theory, fractal geometry. Three lecture hours per week. Spring. Werner, Rial.

160 ENVIRONMENTAL SYSTEMS MODELING (Environmental Studies 106, Geology 116, Marine Sciences 110) (3). Prerequisites, Math 83, Physics 25, or Physics 27 (may be taken concurrently) or permission of instructor. Methods for developing exploratory and predictive models of environmental processes are explored. Includes discussion of relevant scientific modes of analysis, mathematical methods, computational issues, and visualization techniques. Two lecture and one computer laboratory hour per week. Spring. Staff, Rial, Werner.


165 METHODS OF APPLIED MATHEMATICS I (Mathematics 198) (3). Topics: Contour integration in the complex plane; asymptotic expansions and steepest descent/stationary phase methods, special functions often arising in physical applications; elliptic functions and theta functions, Sturm-Liouville spectral theory. Three lecture hours per week. Fall. McLaughlin.

166 METHODS OF APPLIED MATHEMATICS II (Mathematics 199) (3). Topics: Perturbation methods for ODE and PDE, WKBJ method, averaging, modulation theory for linear dispersive PDEs and nonlinear wave equations; long-time asymptotics of Fourier representations of PDEs; Green's functions; physical applications. Three lecture hours per week. Spring. Carrappa.

175 ENVIRONMENTAL RISK ASSESSMENT (3). Prerequisites, Environmental Sciences and Engineering 110, Environmental Sciences and Engineering 130. Methods of environmental risk assessment, including hazard identification, exposure assessment, exposure-response assessment, and risk characterization, are developed and applied. Three lecture hours per week. Spring. Crawford-Brown.

176 QUANTITATIVE RISK ASSESSMENT IN ENVIRONMENTAL HEALTH MICROBIOLOGY (3). Prerequisites, microbiology, epidemiology, and infectious diseases recommended. Survey of alternative approaches, frameworks, and decision-making tools for quantitative risk assessment of microbial pathogens that infect humans and cause disease by the exposure routes of water, food, air, and other vehicles. Spring. (Even numbered years). Sobsey.

185 AMERICAN ENVIRONMENTAL POLICY (City and Regional Planning 185, Public Policy 185) (3). Intensive introduction to environmental management and policy, including environmental and health risks, policy institutions, processes, and instruments; policy analysis, and major elements of American environmental policy. Lectures and case studies. Three lecture hours per week. Fall. Andrews.
200 PROBLEMS IN ENVIRONMENTAL SCIENCES AND ENGINEERING (1 or more). Departmental permission required. For students outside the department who wish to undertake individual study of a specific problem in environmental sciences and engineering. The subject and requirements of the project are arranged with the faculty in each individual instance. One or more hours a week. Fall, spring, summer. Staff.

210 ENVIRONMENTAL PHYSICAL-ORGANIC CHEMISTRY (3). The physical chemistry of the partitioning, exchange, and chemical transformation of organic contaminants in the water, air, and soil environments. Spring. Kamens.

211 INSTRUMENTAL METHODS FOR THE CHEMICAL ANALYSIS OF ENVIRONMENTAL SAMPLES (3). Prerequisite, basic or general chemistry. Emphasis on acquiring laboratory skills and hands-on experience with instrumentation; sample handling and preparation; modern analytical techniques to include chromatography and spectroscopy; quality assurance and control. One lecture hour and four laboratory hours per week. Spring. Weinberg.

212 REDOX PROCESSES (3). Prerequisite, physical chemistry. Redox processes in the aquatic environment. Includes thermodynamics and kinetics; photochemical process in aquatic systems; oxidation processes for treatment of natural and anthropogenic organics, using ozone, peroxides, and UV radiation. Three lecture hours per week. Spring. Glaze.

213 HUMICS CHEMISTRY (1). Prerequisite, Environmental Sciences and Engineering 110. Humic substances in nature; their formation, properties, and methods of isolation. Role of degradation studies in structure determination. One lecture hour per week. Fall. Christman.

214 ANALYSIS OF TRACE ORGANICS (3). Prerequisites, Chemistry 61-62, Chemistry 181-182, and Physics 24-25; permission of the instructor required if prerequisites not met. Basic principles of isolation, separation, and identification of trace organic chemicals in environmental and/or biological samples including solvent extraction, liquid and gas chromatography, and mass spectrometry. Three lecture hours per week. Spring. Hass, Albro.

216 ECOLOGY OF AQUATIC PLANTS AND WETLAND ECOSYSTEMS (3). Prerequisites, Biology 11 Chemistry 11, 21, or permission. Adaptations of aquatic plants and microorganisms of land-water interface regions of lakes and rivers, their nutrition, growth, population dynamics, competition, herbivory, productivity, physiological control measures. Wetlands functions, values to humans. Three lecture hours per week. Spring, even numbered years. Wetzel.

320 PRINCIPLES OF CHEMICAL CARCINOGENESIS (2). Prerequisite, organic chemistry. Bioactivation of carcinogens, interaction of activated metabolites with DNA, and their effects on DNA structure, replication, repair, and the control of these processes during development of chemically induced carcinogenesis. Two lecture hours per week. Spring. Gold.

321 ADVANCED TOXICOLOGY (Toxicology 207) (3). Prerequisite, Pharmacology 202 or permission of the instructor. Cellular and physiological basis of toxicity of environmental chemicals, with emphasis on organ-specific toxicity, development toxicity, and radiation toxicology. Three lecture hours per week. Fall. Swenberg.

322 HEALTH EFFECTS OF OUTDOOR AND INDOOR AIR POLLUTION (3). Prerequisite, knowledge of basic human physiology and biochemistry helpful. Assessing health effects of air pollutants on normal and diseased human populations, including children. Physiology, cellular and molecular biology, immunology, genetics, dosimetry will be integrated. Three lecture hours per week. Fall. Hazucha.

323 BIOLOGICAL MONITORING (2). Prerequisites, ENV 130 or equivalent. This course provides both practical and theoretical information on biological monitoring of chemical exposures and how to evaluate and interpret exposure data. Two lecture hours per week and a term paper (2 credit hours). Spring. Nylander-French.

250 PRINCIPLES OF INDUSTRIAL VENTILATION (3). Prerequisites, calculus and physics; permission of the instructor. Principles of industrial ventilation for contaminant control and design of such systems. Basic laboratory exercises. Two lecture and one laboratory hour per week. Fall. Flynn.

250D VENTILATION DESIGN PROBLEM (1). Corequisite, Environmental Sciences and Engineering 250; prerequisite, permission of the instructor. Design problem for industrial operation. One seminar hour per week. Fall. Flynn.

251 AIR POLLUTION CONTROL (3). Prerequisite, Environmental Sciences 134. Engineering control of air pollution control systems and discussion of air pollution regulation and standards. Spring, odd-numbered years. Leith.

252 DESIGN OF WATER SYSTEMS (3). Prerequisite for non-engineering students, permission of the instructor. Use of mathematical models and computer programs for designing water systems, including pumping stations, reservoirs, water distribution, and wastewater collection networks. Three lecture hours per week. Fall. Lauria and Charaklis.

253 PHYSICAL/ CHEMICAL TREATMENT PROCESSES (2). Prerequisites, Environmental Sciences and Engineering 122 or equivalent, and 171 or equivalent. Fundamental descriptions of disinfection, oxidation, coagulation, precipitation, sedimentation, filtration, adsorption, ion exchange, and membrane processes; applications to water and wastewater treatment. Two lecture hours per week. Spring. DiGiano, Singer.

254 ENVIRONMENTAL PROCESS BIOTECHNOLOGY (3). Prerequisite, a previous or concurrent course in microbiology. Theory and practice of biological processes used to remove contaminants from environmental media, including water, wastewater, soil, and air. Spring. Aiken.

255 WATER AND WASTEWATER TREATMENT PLANT DESIGN (3). Prerequisites, Environmental Sciences and Engineering 263 and 264. The application of the theory of water and wastewater treatment to the design of municipal facilities. The course includes the principles of design and modern design practices. Design and analysis of design of specific works for water and wastewater treatment. Summer. Staff.

256 ENVIRONMENTAL ENGINEERING PROJECT (3). Prerequisite, permission of instructor. Ad hoc project designed for students to work as a team in addressing a current problem in environmental engineering. Projects may include laboratory or pilot-scale studies, collection and analysis of data from full-scale systems, or comprehensive analysis of relevant problems in environmental engineering practice. Three lecture hours per week. Fall. Environmental Engineering staff.

260 MICROENVIRONMENTAL AIR FLOW MODELING (3). Prerequisites, fluid mechanics and permission of the instructor. Applications of finite element and vortex methods for modeling air flows of significance in industrial hygiene applications. Three lecture hours per week. Fall. Flynn.

261 NUMERICAL ODE/PDE I (Mathematics 221, Marine Sciences 221) (3). Prerequisites, Mathematics 191, 192. Single, multistep methods for ODEs: stability regions, the root condition, stiff systems, backward difference formulas; two-point BVPs: stability theory; finite difference methods for linear advection diffusion equations. Three lecture hours per week. Fall. Minion, Miller, Werner.

262 NUMERICAL ODE/PDE II (Mathematics 222, Marine Sciences 222) (3). Prerequisite, Mathematics 220. Elliptic equation methods; finite differences, elements, integral equations; Hyperbolic conservation law methods (Lax-Friedrich, characteristics, entropy condition, shock tracking/capturing); spectral, pseudo-spectral methods; particle methods, fast summation, fast multipole/vortex methods. Three lecture hours per week. Spring. Minion, Miller, Werner.

263 MATHEMATICAL MODELING I (Mathematics 228, Marine Sciences 228) (3). Prerequisites, Mathematics 198, 199, 191, 192. Non-dimensionalization and identification of leading order physical effects with respect to relevant scales and phenomena; derivation of classical models of fluid mechanics (lubrication, slender filament, thin film, Stokes flow); derivation of weakly nonlinear envelope equations. Three lecture hours per week. Fall. Camassa, Forest, Miller, Werner.
264 MATHEMATICAL MODELING II (Mathematics 229, Marine Sciences 229) (3). Prerequisites: Mathematics 198, 199, 191, 192. Current models in science and technology: topics ranging from material science applications (e.g., flow of polymers and LCPs), geophysical applications (e.g., ocean circulation, quasi-geostrophic models, atmospheric vortices). Three lecture hours per week. Spring. Gamassa, Forest, Miller, Werner.

265 MULTIPHASE TRANSPORT PHENOMENA (3). Prerequisites: Environmental Sciences and Engineering 162 or 163 or equivalent. Continuum mechanical approach to formulating mass, momentum, energy, and entropy equations to describe multiphase transport phenomena. Three lecture hours per week. Fall. Miller.

275 MODEL-BASED EXPOSURE MAPPING AND RISK ASSESSMENT (3). Introduction to modern models and techniques for studying environmental and health systems which vary in space and time. Applications in environmental engineering, ecology, epidemiology, geography, and health risk assessment. Spring. Christakos.

276 ADVANCED METHODS OF EXPOSURE ASSESSMENT (3). Prerequisites: Biostatistics 135, 145 (145 may be taken concurrently). Environmental Sciences and Engineering 130 or equivalent; and permission of the instructor required for non-majors. Covers the statistical and biological considerations in assessing environmental exposure to chemicals with particular attention to airborne chemicals in occupational settings. Spring, even-numbered years. Rappaport.


279 MODELLING FOR ENVIRONMENTAL RISK ANALYSIS (Public Policy 208, Political Science 208) (3). Prerequisite: Environmental Sciences and Engineering 180. Mathematical methods for development of advanced models in environmental risk assessment, including exposure assessment and exposure-response assessment, are developed and applied. Three lecture hours per week. Fall. Crawford-Brown.

285 SYSTEMS ANALYSIS IN ENVIRONMENTAL PLANNING (3). Prerequisite: calculus. Applications of systems analysis techniques to the management of environmental quality. Spring. Lauria.

286 WATER AND SANITATION PLANNING AND POLICY IN DEVELOPING COUNTRIES (City and Regional Planning 219) (3). Prerequisite, permission of the instructor. Seminar on policy and planning approaches for providing improved community water and sanitation services in developing countries. Topics covered include the choice of appropriate technology and level of service; pricing, metering, and connection charges; cost recovery and targeting subsidies to the poor; water vending; community participation in the management and operation of water systems; and rent-seeking behavior in the provision of water supplies. Three seminar hours per week. Spring. Whittington.

287 ENVIRONMENTAL POLICY ANALYSIS (Public Policy 253) (3). Prerequisite: Environmental Sciences and Engineering 190 (Public Policy 153 and instructor permission. Advanced topics in Environmental Policy Analysis. Fall and spring. Andrews.

288 CURRENT APPLICATIONS IN ENVIRONMENTAL MANAGEMENT (4). Interdisciplinary group project. Analysis of a current environmental management problem. Topic changes each year. Three lecture hours and one laboratory hour per week. Spring. Staff.

289 PUBLIC INVESTMENT THEORY (City and Regional Planning 232, Public Policy 232) (3). Prerequisite: PLAN 2.01 or equivalent. Basic theory, process, and techniques of public investment planning and decision making, involving synthesis of economic, political and technological aspects. Theory underlying benefit-cost analysis, adaption to a descriptive and normative model for planning public projects and programs. Three lecture hours per week. Spring. Staff.

290 ENVIRONMENTAL LAW (City and Regional Planning 233) (3). Prerequisite, permission of the instructor. An examination of the law of resource use and development, its administration, and underlying policies. Particular attention to water resources law, regulatory law, and natural resource administration. Regulatory aspects of pollution control programs are covered. Three lecture hours a week. Fall. Heath.

291 WATER RESOURCES PLANNING AND POLICY ANALYSIS (City and Regional Planning 234) (3). Prerequisite, permission of the instructor. Water resources planning and management. Federal and state water resources policies. Analytical skills to identify environmental problems associated with urban water resources development. Three lecture hours per week. Fall. Moreau.

292 ENVIRONMENTAL QUALITY PLANNING (City and Regional Planning 236) (3). Planning and analysis of regional environmental systems with focus on management of mass flows that affect the quality of the regional environment. Three lecture hours per week. Spring. Moreau.

300 SEMINAR IN ENVIRONMENTAL SCIENCES AND ENGINEERING (1 or more). Prerequisite, permission of instructor for non-majors. Readings and discussions to provide opportunity to develop new concepts and topics in various aspects of environmental sciences and engineering. Fall, spring, and summer. Staff.

335 Ph.D. SEMINAR IN ENVIRONMENTAL MANAGEMENT AND POLICY (City and Regional Planning 353, Public Policy 353) (1). Prerequisites, doctoral standing and permission of the instructor. Ph.D. seminar on theory, methods, and current research and literature in environmental management and policy. One to two seminar hours per week. Fall or spring, on demand. Andrews.

391 RESEARCH IN ENVIRONMENTAL SCIENCES AND ENGINEERING (1-9). Prerequisites, consultation with the faculty and approval of subject and proposed program and permission of instructor. May be repeated. Hours and credits to be arranged. Fall, spring, summer. Staff.

392 MASTER’S TECHNICAL REPORT (3-9). The technical report requirement for MSPH, MPH, and MSE candidates is satisfied by the extensive study of a problem in environmental sciences and engineering. Fall, spring, and summer. Staff.

393 MASTER’S THESIS (3-9). Fall, spring, and summer. Staff.

394 DOCTORAL DISSERTATION (3-9). Fall, spring, and summer. Staff.

DEPARTMENT OF EPIDEMIOLOGY (EPID)

DAVID A. SAVITZ, Chair

Professors

LENORE ARAB (165) Nutritional Epidemiology
GERALDO HEIT (41) Cardiovascular Epidemiology
IRV Hertz-Picciotto (137) Environmental Epidemiology, Reproductive Epidemiology
BARBARA S. Hulka (95) Cancer Epidemiology, Biochemical Epidemiology, Health Services Research

MICHEL A. IRVIN (96) Health Services Research and Health Policy, Cardiovascular Epidemiology, Cancer Epidemiology, Case-Control Studies

BERTON H. KAPLAN (30) Social Epidemiology

DANA P. LOOMIS (130) Occupational Epidemiology, Environmental Epidemiology

STEVEN R. MESTICK (200) Infectious Disease Epidemiology

ANDREW F. OLSHAN (147) Reproductive Epidemiology

ROBERT W. RYDER (197) Infectious Disease Epidemiology

ROBERT S. Sandler (73) Cancer Epidemiology

DAVID A. SAVITZ (101) Reproductive Epidemiology

JOHN R. SEED (144) Biochemistry of the Host-Parasite Relationship

CARL M. SHY (14) Environmental Epidemiology, Occupational Epidemiology, Cancer Epidemiology

HERMAN A. TIRROL (13) Cardiovascular Epidemiology

DAVID J. WEBER (96) Infectious Disease Epidemiology
Associate Professors
Ralph S. Baric (142) Public Health Virology, Molecular Virology
J. Ties Boerma (201) Infectious Disease Epidemiology
Marilee D. Gammon (193) Cancer Epidemiology
James E. Hall (143) Host-Parasite Metabolism, Biological Chemistry
Robert C. Millikan (166) Cancer Epidemiology
Charles L. Poole (193) Methodology
Wayne D. Rosamond (162) Cardiovascular Epidemiology
Victoria J. Schoenbach (64) Behavioral Epidemiology, Infectious Diseases
   Epidemiology (Primarily STDs), Cancer Control (Primarily Smoking Cessation)
Lola V. Stamn (145) Public Health Bacteriology, Molecular Cloning, Pathogenesis
   of Infectious Disease
H. June Steens (172) Nutritional Epidemiology
James C. Thomas (127) Infectious Disease Epidemiology
Kristen Ann Weigle (112) Infectious Disease
Steven B. Wing (99) Cardiovascular Epidemiology, Occupational/Environmental
   Epidemiology

Assistant Professors
Mark Daniel (198) Social Epidemiology, Chronic Disease Epidemiology
Katherine E. Harrman (196) Reproductive Epidemiology, Women's Health
Jay S. Kaufman (194) Social Epidemiology, Chronic Disease Epidemiology
Stephen W. Marshall (199) Injury Epidemiology, Methodology
William C. Miller (191) Infectious Disease and Clinical Epidemiology
Beverly J. Rockhill (204) Cancer Epidemiology, Methodology, Women's Health
Jane C. Schoeder (203) Cancer Epidemiology, Environmental Epidemiology,
   Genetic Epidemiology
Annelies van Rie (202) Infectious Disease

Research Assistant Professors
Wilfrieda Behets, Infectious Disease Epidemiology
Myra Carpenter, Cardiovascular Epidemiology
Kathleen C. Dorse, Cancer Epidemiology
Kelly R. Eveson, Cardiovascular Epidemiology
Sara Hsu, Cardiovascular Epidemiology
David B. Richardson, Environmental Epidemiology
Kathryn M. Rose, Cardiovascular Epidemiology, Women's Health
Sharon S. Weir, Infectious Disease Epidemiology

Clinical Professors
Timothy S. Carey (138) Clinical Epidemiology
Gordon H. DeFriese (94) Health Services Research
Jo-David Fine (179) Epidemiology of Skin Diseases
Curtis G. Hames (44) Clinical Epidemiology
David F. Ranschoff (160) Health Care Epidemiology
Desmond K. Runyan (88) Clinical Epidemiology/Pediatrics
Ross J. Simpson Jr., Cardiovascular Epidemiology, Health Care Epidemiology
Philip D. Sloane (131) Aging
Ronald P. Strauss (182) Oral Epidemiology
Edward H. Wagner (15) Clinical Epidemiology, Health Services Research

Clinical Associate Professors
Peter A. Margolis (155) Health Care Epidemiology
Bonnie Rogers (187) Occupational Epidemiology

Clinical Assistant Professors
Adora Adimora, Infectious Diseases Epidemiology
Lorraine Alexander
Kimberly Fox, Infectious Diseases Epidemiology
Debbie Gibson, Health Care Epidemiology
Michael J. McMahon, Reproductive Epidemiology
Gary Slade, Oral Epidemiology
Sheryl Zimmerman, Aging

Adjunct Professors
Naouar Almeida-Filho, Psychosocial Epidemiology
James D. Beck (167) Dental Epidemiology
Dan German Blazer (108) Psychosocial and Aging Epidemiology
Gregory L. Burke, Cardiovascular Epidemiology
Willard Cates (188) Reproductive and Infectious Disease Epidemiology
Joan Corrioni-Huntley (04) Aging, Physical, Cognitive, and Social Functioning
John R. Crouse (103) Cardiovascular Epidemiology
Robert Desowitz, Infectious Disease Epidemiology
Suzanne Fletcher, Health Care Epidemiology
Judith A. Fortney (116) Reproductive Epidemiology
Jean G. French (129) Environmental Epidemiology, Occupational Epidemiology
Raymond S. Greenberg (86) Cancer Epidemiology
Harry A. Guess (121) Pharmacoeconomics
Sherman A. James (07) Psychosocial Epidemiology, Cardiovascular Epidemiology
C. David Jenkins, Social Epidemiology
Ulrich Kell (169) Cardiovascular Epidemiology, Occupational Epidemiology
Ruth E. Little (173) Reproductive Epidemiology
Newt MacCormack, Infectious Disease Epidemiology
Melinda S. Meade (58) Medical Geography
Beth Newman (139) Genetic Epidemiology, Cancer Epidemiology
George Parkerson Jr., Health Care Epidemiology
Walter J. Rogan (39) Environmental Epidemiology
Michael Rosenberg, Reproductive Epidemiology
Dale Sandler (90) Environmental Epidemiology
Arnold Schecter, Environmental and Occupational Epidemiology
Ilene C. Siegler (148) Aging
John W. Stamn (92) Dental Epidemiology
Steven Teusch, Chronic and Infectious Disease Epidemiology
Hugh H. Tilson (87) Pharmacoeconomics
Clarice Weinberg, Environmental and Reproductive Epidemiology
Allen J. Wilcox (61) Reproductive Epidemiology
Redford Williams (141) Cardiovascular Epidemiology

Adjunct Associate Professors
Timothy Earl Aldrich (124) Cancer Epidemiology
Elizabeth B. Andrews (140) Pharmacoeconomics
Donna D. Baird (104) Reproductive Epidemiology
John Barefoot (151) Cardiovascular Epidemiology, Psychosocial Epidemiology
Douglas Bell, Cancer Epidemiology
Leigh Callahan, Chronic Disease Epidemiology, Health Care Epidemiology
Dennis A. Clements (152) Infectious Disease Epidemiology
Thomas B. Cole (128) Injury Epidemiology
John Dement, Environmental Epidemiology, Occupational Epidemiology
Bruce Duncan, Cardiovascular Epidemiology
Joanne M. Garrett (150) Health Services Research
Paul A. Godley (181) Cancer Epidemiology
Russell P. Harris (125) Cancer Epidemiology, Clinical Epidemiology
Joanne Jordan, Chronic Disease Epidemiology
Suzanne Landis, Infectious Disease Epidemiology
Stephanie London, Cancer Epidemiology
Matthew Longnecker, Environmental and Occupational Epidemiology
Margaret F. McCann (100) Reproductive Epidemiology
William F. McDonnell III (170) Environmental Epidemiology
Christine L. Mor (174) Infectious Disease Epidemiology
Dexter L. Morris (113) Cancer Epidemiology
Lucas Neas, Environmental Epidemiology
Miquel Porta, Cancer Epidemiology, Clinical Epidemiology, Pharmacoeconomics
Carroll W. Runyan (154) Injury Control
Joellen M. Schildkrout (126) Cancer Epidemiology
Maria Schmidt, Chronic Disease Epidemiology
Betsy Sleath, Health Care Epidemiology
C. Gregory Smith (83) Environmental and Occupational Epidemiology
David S. Strohza (97) Psychosocial Epidemiology, Cardiovascular Epidemiology
John Thorpe Jr., Reproductive Epidemiology
Alice D. White (117) Cardiovascular Epidemiology
Timothy C. Wilcosky (98) Cancer Epidemiology
Bonnie C. Yankaskas (82) Diagnostic Radiology/Cancer Epidemiology

Adjunct Assistant Professors
Daniel J. Caplan, Oral Epidemiology
Lori Carter Edwards (192) Cardiovascular Epidemiology
Glenda S. Cooper (196) Chronic Disease Epidemiology, Reproductive Epidemiology
Giselle Corbie-Smith, Women's Health
Sara Epstein, Chronic Disease Epidemiology
Paul J. Feldblum (180) Infectious Disease Epidemiology
Bradley N. Gaynes, Psychiatric Epidemiology
Maria Hall, Aging and Chronic Disease Epidemiology
Jane Hoppin, Environmental Epidemiology
Debra E. Irwin (176) Cancer Epidemiology, Reproductive Epidemiology
Esther C. Janowsky, Cancer Epidemiology
Duanping Liao (189) Cardiovascular Epidemiology
Hester Lipscomb, Environmental and Occupational Epidemiology
William C. Maier, Pharmacoepidemiology
Pauline Mendola, Occupation, Environmental, and Reproductive Epidemiology
Patricia Moorman, Cancer Epidemiology
Andrew S. Rowland (180) Environmental Epidemiology
Gregory P. Samsa (135) Methodology
Vilma Santana, Occupational Epidemiology
Williams Saunders, Psychosocial Epidemiology
Pamela Schwing, Chronic Disease Epidemiology, Reproductive Epidemiology
David C. Sokal (178) Reproductive Epidemiology
Paul E. Stang (163) Chronic Disease Epidemiology
Martha E. Stieb, Infectious Disease Epidemiology, Veterinary Epidemiology
Jack Taylor, Environmental and Occupational Epidemiology
Patricia S. Tennis (107) Pharmacopidemiology
Emmanuel Walter, Infectious Disease Epidemiology
Suzanne West, Health Care Epidemiology

168 FUNDAMENTALS OF EPIDEMIOLOGY (4). Prequisite, BIOS 110. Permission required for nonmajors. An intensive introduction to epidemiological concepts and methods for students intending to engage in, collaborate in, or interpret the results of epidemiologic studies. Some familiarity with biomedical concepts may be required. An alternate to EPID 160 for satisfying the SPID core requirements. Three lecture and two seminar hours a week. Fall. Rosamond, Gannm.

170 CLINICAL MEASUREMENT/EVALUATION (PBH 260) (3). Prerequisites, Epidemiology or Health Care and Prevention major. An introduction to the fundamental concepts of epidemiology, including clinical epidemiology, for clinicians. Emphasis is to applications in clinical research and practice. Fall. Miller.

201 EPIDEMIOLOGIC RESEARCH METHODS (3). Prerequisites, EPID 268, majors only, permission of the instructor if not in at least second year of doctoral program. A second-level course in the design and conduct of epidemiologic research. Each student will comprehensively address the conceptual and practical aspects of developing a high quality, detailed research proposal. Spring. Savitz, Heis, Ryder.

203 DATA ANALYSIS IN ORAL EPIDEMIOLOGY (2-3). Prerequisite, basic knowledge of SAS. Permission required. Data analysis project in oral epidemiology: data cleanup, file construction, analysis. For three credit hours, student also completes multivariate analysis with linear, logistic regression. Project to result in publishable paper. Two to three seminar hours a week. Fall. Slade.

205 CLINICAL EPIDEMIOLOGY AND CLINICAL RESEARCH METHODS (6). Permission required. Intense interdisciplinary approach to clinical research intended primarily for physicians committed to clinical investigation. Epidemiologic, social science, and decision-analytic methods; medical ethics, health policy, health economics, medical care epidemiology. Five lecture and two seminar hours a week. Fall. Garrett.

206 CLINICAL RESEARCH SKILLS (4). Permission required. Practical research skills for clinical investigators, including grant application, instrument development, project management, data management, data analysis, and the communication of research results. Four lecture hours a week. Spring. Garrett.

210 FOUNDATIONS OF PUBLIC HEALTH ETHICS (3). Basic ethical rationales underlying concerns central to public health. These include: ethical reasoning; concepts of justice; the influences of religion; principles of interacting with communities; professional conduct; and research ethics. (On request.) Thomas.

212 EPIDEMIOLOGY OF MEDICAL CARE (2). Prerequisite, EPID 160 or equivalent. Epidemiology applied to issues in health care; variations in disease and medical care, quality of care measures, role of health care in determination of trends, epidemiological approaches in planning/policy. Three lecture hours a week. (On request.) Ibrahim, Carey, R. Sandler, Harris.

213 EPIDEMIOLOGIC SURVEILLANCE IN PUBLIC HEALTH (3). Prerequisite, EPID 160 or equivalent. Provides conceptual foundations and practical skills for designing and implementing surveillance systems, and for using surveillance data for the conduct and evaluation of public health programs and research. (On request.) Loomis.

215 EMERGING AND RE-EMERGING INFECTIOUS DISEASES (4). Overview of basic principles of infectious diseases, focusing on human pathogens of public health importance. Includes a general introduction to the biology of viruses, bacteria, and eukaryotic parasites. Four lecture hours a week. Spring, Seed, Baric, Hall, Stamm.

216 HISTORY OF EPIDEMIOLOGY (3). Prerequisites, EPID 160 or 168 and introductory biostatistics. The changing form and content of epidemiology considered in historical context, focusing on Western countries 1700-present. Discussion includes goals, concepts, methods, and relationships with statistics, medicine, and public health. Three lecture hours a week. (On request.) Loomis.

217 PHILOSOPHY OF EPIDEMIOLOGY (3). Prerequisites, EPID 268 and BIOS 145. A forum for evaluating the place of epidemiology in science, public health, and society, focusing on the nature of objectivity and the social construction of epidemiological knowledge. Three lecture hours per week. (On request.) Wing.
218 INTRODUCTION TO METHODS IN INFECTIOUS DISEASE EPIDEMIOLOGY (3). Prerequisites, introductory epidemiology and biostatistics. Introduction to infectious disease epidemiology. Course focuses on methodology, public health concerns, patterns of transmission, and newly discovered infections; and diseases in developed countries, especially the United States. Three lecture hours a week. Fall. Weber.

219 PERINATAL EPIDEMIOLOGY (MHCH 219) (3). Prerequisites, EPID 160 and BIOS 110, or equivalents. Epidemiology of reproductive and perinatal health outcomes, including infertility, fetal loss, preterm birth, birth weight, congenital malformations, infant mortality. Includes current knowledge regarding epidemiology of these outcomes, discussion of methodologic issues. Fall. Othman, McMahon.

221 HIV/AIDS EPIDEMIOLOGY (2). Prerequisite, EPID 160 or equivalent. Permission of instructor required. Emphasis on epidemiology of HIV/AIDS and methods of surveillance, other public health activities, and studies of transmission and natural history. Coverage of historic and late-breaking topics in an interactive format. Two lecture hours per week. (On request.)

222 EPIDEMIOLOGY OF IMMUNIZATIONS (3). Prerequisite, EPID 160 or equivalent. This course explores the application of epidemiological methods to immunization practices. Topics include vaccine development, vaccine efficacy, post-licensing evaluation, vaccine coverage, and cost-benefit analysis. Three lecture hours a week. (On request.)

224 METHODS IN THE STUDY AND CONTROL OF SEXUALLY TRANSMITTED DISEASES (3). Prerequisite, EPID 160 or equivalent. Course aims to familiarize students with current knowledge of epidemiology of sexually transmitted diseases and how to study these diseases. Extensive discussion of issues in the control of STDs. Three lecture hours a week. (On request.) Thomas.


226 CONTROL OF INFECTIOUS DISEASES IN DEVELOPING COUNTRIES (1-3). Prerequisite, EPID 160 or 168. Orientation to control and study of infectious diseases in developing countries. Principles of planning, conduct, evaluation of field studies/projects; emphasis on infectious diarrheal diseases, vector-borne infections, parasitic diseases. One lecture and two to four seminar hours a week. (On request.) Staff.

229 GENETIC EPIDEMIOLOGY, METHODS AND APPLICATIONS (3). Prerequisites, EPID 268 and BIOS 145 or permission of the instructor. Concepts and methods of genetic epidemiology relevant to study of complex human diseases, including segregation analysis, linkage analysis, and gene-environment interaction. Includes whole genome approaches, as well as non-human systems. Three lecture hours a week. (On request.) Millikan.

230 MOLECULAR EPIDEMIOLOGY TECHNIQUES (3-4). Prerequisites, undergraduate level biology and genetic course(s). Permission of instructor required. Using infectious, cancer, and cardiovascular diseases as models, molecular and genetic techniques are discussed and applied toward understanding environmental and genetic factors in the development of complex diseases in populations. Three lecture hours per week; one hour lab optional. Baric, Millikan.

232 METHODS AND ISSUES IN PHARMACOEPIEMIOLOGY (3). Prerequisites, introductory-level epidemiology and biostatistics. Application of the epidemiologic knowledge, methodology, and reasoning to the study of the effects (beneficial and adverse) and uses of drugs in human populations. (On request.) Guess.

233 CANCER EPIDEMIOLOGY AND PATHOGENESIS (3). Prerequisite, EPID 168 or equivalent, BIOS 110, undergraduate major or strong preparation in the biological sciences. Permission of the instructor required for nonmajors. Emphasis on integration of epidemiologic data with laboratory and clinical research findings. Issues in epidemiologic research design, analysis, and interpretation are presented within the context of substantive epidemiology. Three lecture hours a week. (On request.)

234 CANCER EPIDEMIOLOGY METHODS (3). Prerequisite, EPID 268. Interpretation of cancer statistics, lead time, life table bias, screening, causation, multistage models, field studies. Applications include: cancer in developing countries, psychiatric and public policy issues. Three lecture hours per week. (On request.) Millikan.

256 CARDIOVASCULAR DISEASE EPIDEMIOLOGY (3). Prerequisites, introductory epidemiology and biostatistics. Review of the main causes of cardiovascular disease morbidity and mortality, and their population determinants. Topics include epidemiologic methods, risk factors, strategies for prevention, and a student research project. Three lecture hours a week. Fall. Heiss, Davis.

257 TEACHING EXPERIENCE IN EPIDEMIOLOGY (1-4). Prerequisite, EPID major, second year or above. Provides epidemiology majors with supervised experience in teaching and course preparation. Students act as assistants in departmental courses. Two to eight seminar hours a week. Fall and spring. Staff.

258 ADVANCED CARDIOVASCULAR DISEASE EPIDEMIOLOGY (3). Prerequisites, EPID 168 and 256, or permission of instructor. Contemporary findings, methodologic issues, and research recommendations in cardiovascular epidemiology. Topics include risk factors, trends, interventions, and health care. Students critique research and participate in a field experience. (On request.) Rosamond.

259 NUTRITIONAL EPIDEMIOLOGY (NUTR 259) (3). Prerequisites, EPID 160 or 168 and BIOS 101 or 110. This course builds the foundation for critical evaluation of the nutritional epidemiologic literature. Three lecture hours a week. Spring, Stevens, Arab.

261 OBESITY EPIDEMIOLOGY (NUTR 261) (3). Prerequisites, EPID 160 or 168 and BIOS 110. Examines epidemiologic research on the causes, consequences, and prevention of obesity. Emphasis on methodologic issues pertinent to obesity research. Spring, Stevens.

262 DIET AND CANCER (NUTR 262) (3). Prerequisites, EPID 160 or 168 and BIOS 110. Examines epidemiologic research on food-related exposures and prevention of cancer at various sites. Emphasis on skills for conducting and analyzing epidemiologic studies on gene-nutrient interactions in carcinogenesis. Spring, Arab.

266 EPIDEMIOLOGIC INVESTIGATION (3). Prerequisites, EPID 160, EPID 256 and BIOS 110, or their equivalents. Permission required. Second-level course in epidemiologic research/investigation of current issues in cardiovascular disease. Epidemiologic study design, analysis, and interpretation are applied in implementing a research project. Current data files available. Three lecture hours a week. (On request.) Heiss.

268 THEORY AND QUANTITATIVE METHODS IN EPIDEMIOLOGY (5). Prerequisites, EPID 168, BIOS 145, and competence in SAS or STATA. Permission required for nonmajors. An in-depth treatment of basic concepts and skills in epidemiologic research, including problem conceptualization, study design, research conduct, data analysis and interpretation. Spring, Poole, Miller.

269 ADVANCED METHODS FOR EPIDEMIOLOGIC DATA ANALYSIS (5). Prerequisite, EPID 268, BIOS 145, and computer competence in data analysis. Permission required for nonmajors. Concepts and applications, including historic overview, logistic regression, survival analysis, Poisson regression, model building strategy, additive and multiplicative interaction, and graphical exploration. Includes computer-based experience with real data. Two lecture and four lab hours a week. Fall. Kaufman, Marshall.

276 OCCUPATIONAL EPIDEMIOLOGY (3). Prerequisites, introductory epidemiology and biostatistics. This course provides a background in the epidemiology of work-related illness and injury and the application of epidemiologic concepts and methods in promoting workers' health and safety. (On request.) Loomis.
277 ENVIRONMENTAL EPIDEMIOLOGY (3). Prerequisites, EPID 168 and BIOS 110. Epidemiologic ideas and methods applied to evaluation and control of human health consequences of environmental hazards. Pollution of environmental media and global change are considered from a human-ecological perspective, with local and international examples. Three lecture hours per week. (On request.) Loomis.

278 COMMUNITY-DRIVEN EPIDEMIOLOGY AND ENVIRONMENTAL JUSTICE (2). Principles for conducting research within communities unduly burdened by environmental health threats are presented. Topics include research ethics, community presentations, study design and implementation, and student research projects. (On request.) Wing.

290 CANCER PREVENTION AND CONTROL SEMINAR (HPAA 290, HBHE 290) (3). Permission required for non-graduate students. An interdisciplinary overview of cancer prevention and control. Emphasis on projects and activities from perspectives of epidemiology, health behavior and education, and health policy and administration. Appropriate research design and methodologies will be covered. Fall. Kaluzny.

301 PHARMACOEPIEMIDIOLOGY SEMINAR (1). Prerequisites, basic knowledge of epidemiology and biostatistics. This is a weekly seminar to explore current problems in pharmacoepidemiology. It supplements the introductory course. May be repeated. Two seminar hours per week. (On request.)

302 INFECTIOUS DISEASE SEMINAR (1). Prerequisites, introductory epidemiology and biostatistics. Detailed review of selected topics in infectious disease epidemiology. May be repeated for credit.

303 SEMINAR IN ORAL EPIDEMIOLOGY (1). Prerequisite, EPID 168. Explores conceptual and methodological issues in conducting epidemiologic investigations of oral conditions, specifically carries, periodontal disease, and oral cancer (topics rotate semester). Spring. Beck.

305 SEMINAR IN CLINICAL RESEARCH (1). Prerequisite, CRC Fellow or permission of instructor. Practical topics pertinent to clinical research will be presented by faculty on campus and from local industry. Fellows in the Clinical Research Curriculum will also present their work. (On request.) Carey, Rasch.

315 FIELD TRAINING IN EPIDEMIOLOGY (3-6). Prerequisite, advanced standing. Designed to give epidemiology majors a supervised field experience in population health research. Fall, spring, summer. Faculty.

325 CANCER RESEARCH SEMINAR (1). Local cancer researchers discuss their ongoing research activities and opportunities for students. Students are responsible for reading background material prior to seminars. (On request.) Faculty.

335 ADVANCED CANCER EPIDEMIOLOGY: CLASSIC AND CONTEMPORARY CONTROVERSIES IN CANCER CAUSATION (2). Prerequisites, EPID 268 and 269 and EPID 233 or 234. Permission of instructor required. Readings and discussions on classic and contemporary controversies in cancer causation. Two seminar hours per week. (On request.)

350 REPRODUCTIVE EPIDEMIOLOGY SEMINAR (1-2). Prerequisites, introductory epidemiology, introductory biostatistics, and EPID 219. Permission of the instructor. Detailed review of selected topics in reproductive epidemiology. May be repeated for credit. (On request.) Olshan.

351 ADVANCED SEMINAR IN CARDIOVASCULAR RESEARCH (1-3). Permission required. Review of substantive and methodology research in cardiovascular and cerebrovascular diseases. May be repeated for credit. Two to six seminar hours a week. (On request.) Heiss.

358 ADVANCED NUTRITIONAL EPIDEMIOLOGY OF CARCINOMA- SIS (NUTR 358) (3). Prerequisites, BIOS 145 and EPID 160 or 168; NUTR 259 or equivalent. Permission required. Examples of diet-gene interactions in carcinogenesis will be used in the study of the tools and skills needed for nutritional epidemiologic research. (On request.) Azar.

359 EPIDEMIOLOGY LABORATORY PRACTICUM (1-9). Permission required. Students work individually with a faculty member on supervised laboratory research and skills development. May be repeated for credit. Two to eighteen laboratory hours a week. Fall, spring. Baric, Hall, Seed, Stamm.

360, 361 RESEARCH IN EPIDEMIOLOGY (Var.). Prerequisite, permission of the instructor. Independent investigation in consultation with an instructor who must assign or approve the subject of research. Credits vary according to the effort and rigor of the research. Fall, spring, summer. Faculty.

368 EPIDEMIOLOGY IN HEALTH POLICY AND CLINICAL DECISIONS (2). Prerequisites, knowledge of introductory level epidemiology recommended. Evidence-based decisions about public policy, clinical practice, and government regulations—perspectives of science, government, industry, media, and courts. Toxic shock, environmental hazards, alternative medicine, tobacco, diet pills, breast implants. (On request.) Ibrahim.

369 READINGS IN METHODS FOR EPIDEMIOLOGY (1). Prerequisites, EPID 268 and 269, and BIOS 145. A course for advanced students exploring methodological issues in epidemiology, including measurement error, missing data, intermediate variables, complex study designs and modeling techniques, meta-analysis, sphenoids, and other topics. (On request.) Hertz-Picciotto.

380 HOSPITAL EPIDEMIOLOGY (1-2). Prerequisites, EPID 168 and EPID 218. Permission of the instructor required. Comprehensive seminar in hospital infection control. Topics include issues in employee health, surveillance, outbreak investigation, environmental sampling, and policy formation. May be repeated for credit. Two to four seminar hours. Spring, summer. Weber.

390 EPIDEMIOLOGY DOCTORAL SEMINAR (2). Open to first-year epidemiology doctoral students only. Explores students to issues and debates in the philosophy of science, the object of knowledge in epidemiology, and the role of epidemiology in public health. Fall. Wing.

392 MASTER'S PAPER (Var.). Fall, spring, and summer. Graduate faculty.

394 DOCTORAL DISSERTATION (Var.) Fall, spring, and summer. Graduate faculty.

DEPARTMENT OF HEALTH BEHAVIOR AND HEALTH EDUCATION (HBHE)

JO ANNE L. EARP, Chair

Professors
Karl Bauman (33) Adolescent Alcohol and Drug Use Prevention, Research Methods
Brenda M. DeVellis (13) Health Education Theory, Patient Education
Jo Anne L. Earp (10) Health Education Evaluation, Women's Health, Cancer Control
Eugenia Eng (17) International Health, Community Health Education, Lay Health Advisor Interventions
Elizabeth Mutran (32) Health of the Elderly, Minority Health, Research Methods
Carol Runyan (31) Injury Control, Violence Prevention, Worksite Injury Prevention
James R. Sorensen (30) Human Genetics, Public Health Ethics, Theory in Practice
Allan Steckler (12) Qualitative Methods, Organizational Change, Native Americans

Associate Professors
Susan T. Ennett (45) Social Networks, Adolescent Health Risk Behaviors, Research Methods
Vangie Foshee (43) Dating Violence, Adolescent Health, Program Evaluation
Christine Jackson (42) Substance Abuse Prevention, Social Norms, Children's Health

Assistant Professors
Carolyn Parks-Bain (47) Community Health, Minority Health, Community Assets
Mark Daniel (65) Health Promotion and Disease Prevention, Social Epidemiology, Prevention Intervention Methodology, Behavioral Medicine
Laura Linnan (66) Applied Research in Worksite and Other Community-Based Settings, Multiple Risk Factor Behaviors, Organizational Change
Megan Lewis (63) Social Relationships and Health, Cardiovascular Disease, Social Ecology
Kurt Ribul (64) Mass Media and Policy-Based Health Promotion Interventions, Tobacco Control

Research Professor
Robert Devellis (23) Research Methods, Health Behavior, Health Psychology

Research Associate Professors
H. Douglas Robertson (71) Highway, Traffic, Pedestrian, and Bicycle Safety, Transportation Policy, Development
H.P. Whiteside (84) Women's Smoking Cessation, Strategic Planning, Communications and Grant Writing

Research Assistant Professors
James Michael Bowling (48) Injury Prevention, Statistics and Methods, Program Evaluation
Carolyn Crump (49) Worksite Health Promotion and Evaluation, Program Planning, Management
Carol Golin (88) Adherence to Chronic Medical Therapy, Patient-Provider Communication, Medical Decision Making for HIV Therapy and Prevention
Elizabeth Moracco (67) Women's Health and Violence Prevention

Lecturers
Mary Alipeter (80) Health of the Elderly, Breast Cancer Research
Thomas A. Burleson (59) Rural Health, Applied Social Anthropology
Sallie Benedetti (56) Worksite Health Promotion
Linda Carl (60) Adult Education, Community Programs
Forrest Council (55) Roadway Safety and Driver Education
Janet Dal Santo (80) Injury Prevention, Child Labor, Childhood Injuries and Environmental Health
Susan Gaylord (57) Preventive Medicine, Rural Health
Shelley Golden (87) Training and Facilitation, Health Communications, Population-level Public Health Determinants and Health Policy
Linda Kinsinger (53) Prevention in Primary Care, Smoking Cessation Counseling, Health Promotion and Disease Prevention
Alexis Moore, Cancer Control Research, Focus on Behavioral Aspects of Mammography Screening and Issues Involving Cancer Genetics Risk Assessment
Anna Waller (54) Injury Control and Prevention, Violence Prevention

Adjunct Professors
Walter C. Farrell Jr. (77) Urban Poverty, Minority Populations, Social Change
Kenneth McInerney (25) Program Evaluation, Health Behavior
Victor W. Marshall (81) Aging and Work/Retirement, Aging and Health/Health Care, Health Public Policy
Barbara Rinner (82) Cancer Control and Prevention, Tailored Print Communications
Michael Schuman (83) Occupational Injury and Mortality, Teen Workers, Work, Organization and Industry

Adjunct Associate Professors
Lynn H. Blanchard (51) Interdisciplinary Training, Community Health Education
Christopher Ringwalt (40) Adolescent Drug and Alcohol Use Prevention

Adjunct Assistant Professors
Deborah Billings, Reproductive Health, Gender, Migration
Stephen Ciesielski (72) Latino Health, Primary Health Care
William Dow (37) Primary Health Care, Economic Development and Technology
Robert Frewling (73) Drug and Alcohol Abuse Prevention Research
Anna Page Holmes, Community Health Education
David Jolly (74) STDs/HIV/AIDS Training and Research, Program Planning and Evaluation, Gay and Lesbian Health Issues
John Key, Community Health Education
Amin Khalil, Program Development, Organization/Management of Health Services and Education
Colleen McBride (79) Cancer Control and Prevention, Women's Health, Smoking Cessation
David McCoy, Native Americans Health, Community Health Education, Program Planning
Charles Morrison, HIV/AIDS, Epidemiology Research
M. J. Paschall (75) Adolescent Risk Behavior Epidemiology and Prevention, Research Methods, Program Evaluation
Elizabeth Randall-David (70) Women's Health, Empowerment Education, Program Planning and Evaluation
M. J. Settle (46) Health Promotion and Disease Prevention
Paige Hall Smith (76) Domestic Violence, Women's Health, Qualitative Research Methods
Jason Smith (68) Reproductive Health, International Health, Epidemiology
Jae Vella (41) Adult Education, Cross-Cultural Program Planning
Claire Vladiro (85) Qualitative Research, Hispanic/Latino Health, Women's Health

Adjunct Instructors
Paul Alton, Adult Health, Community Health Education, Program Planning
Kathryn Blue, Community Health Education, Policy Development
Mary Bobbitt-Cook, Community Health Education
Teresa Friscia, International Health and Program Planning, Community Health Education, Communicable Diseases
Carmen Hernandez-Polletier, Farm Worker Health, Latino Health
Deborah Hillgrenberg, Research, Community Health Education
Vanessa Jeffries, Community-Based Public Health Education, Minority Health Issues, Evaluation
Rhondette Jones, Community Development, Lay Health Advisers, Maternal and Child Health
Dennis Joyner, Population-Based Community Health Planning, Community Health Assessment, Health Promotion Program Planning and Development
Karen Monaco, Tobacco Control - Adult and Teen Smoking Cessation, Program Development, Training
Karen Moore, International Health, Program Planning, Program Evaluation
Regina Penney, Community Health Education
Margaret Pollard, Community Health Education
Lafouma Romack, Global Health, Health Communication, HIV/AIDS
Anna Schenck, Epidemiology, Cancer Prevention and Control, Evaluation
Elizabeth Stern, Domestic Violence, Hispanic/Latino Health
Julie Sweedler, Media, Marketing and Promotion Advocacy, Coalition Building
Emily Tyler, Community Health Practice, Credentialing Issues
Eugenia Upchurch, Health of the Elderly, Access to Health Care, Public Policy Regarding Health Care for the Elderly
Karen Webb, Mental Health, Substance Abuse Prevention, Support Group Development

Professors Emeriti
Harriet H. Barr
Leonard H. Dawson
John Hatch
Evel B. Jackson
Eunice N. Tyler

Courses
109 RURAL HEALTH AND COMMUNITY ACTION (3). Prerequisite, permission of the instructor. Community education and action as modes of intervention in rural communities. Cross-cultural perspectives of rural development. Three seminar hours per week. Fall Staff.

125 INJURY AS A PUBLIC HEALTH PROBLEM (MHCH 125, EPID 125) (3). Prerequisite, EPID 160 or equivalent. This course considers the causes and consequences of traumatic injury within developmental, social, and economic contexts, and dilemmas in injury prevention. Injuries associated with transportation, violence, and the home and occupational environments are included. Three lecture hours per week. Fall Runyan and Kitco.
130 SOCIAL AND BEHAVIORAL SCIENCE FOUNDATIONS OF HEALTH EDUCATION (Vary). Selected social and behavioral science theories and concepts that apply to the analysis of health-related behavior and to the generation of intervention strategies. Three lecture hours per week; one seminar hour. Fall. Lewis.

131 SOCIAL AND BEHAVIORAL SCIENCES IN PUBLIC HEALTH (2). This course focuses on social and behavioral science theories, research, and interventions aimed at promoting health of individuals, groups, communities, and populations. Two lecture hours per week. Spring. Eap.

140, 141, 142 PROBLEMS IN HEALTH EDUCATION (1 or more). Prerequisites to be arranged with the faculty in each individual case, depending upon the problem that is to be studied. A course for students of public health who wish to make an intensive study of some special problem in public health education. Fall, spring, and summer. Staff.

160 INTRODUCTION TO WOMEN'S HEALTH AND HEALTH EDUCATION (WMST 161) (3). Using a lecture-discussion format, this course provides an overview of women's health-specific interests as family and community members, as patients, and as health professionals. Implications for health education practice as well as opportunities for future research are emphasized. Two lecture and two seminar hours per week. Offered every other fall. Moracco.

164 HEALTH POLICY AND AGING (HPAA 164) (3). Critical examination of aging policy in light of empirical findings on the elderly's economic power. Utilization patterns, prevalence of dependency, and the cost effectiveness of policy options, including long-term care. Three seminar hours per week. Staff.

172 PLANNING HEALTH PROMOTION IN COMMUNITY, WORKSITE, SCHOOL, AND MEDICAL SETTINGS (4). Prerequisite, permission required for nonmajors. This course builds skills in developing components of health promotion programming in a variety of settings. It emphasizes use of needs and capacity assessments to identify focus of interventions; strategies for evaluating programs; application of health promotion models and program planning. Fall. Linnan.

189 ADOLESCENT HEALTH RISK BEHAVIORS (3). This course covers the epidemiology, etiology, and prevention of adolescent health risk behaviors including substance use, violence, and sexual behavior. Theories of adolescent behavior and methodological issues related to research on adolescents are also emphasized. Three lecture hours per week. Fall. Ennett.

190 PSYCHOSOCIAL ASPECTS OF AGING (PHNU 190, HPAA 190) (3). Psychosocial aspects of the aging process and of old age. Needs of the elderly and their reactions to agencies and programs for the aged. Two lecture and two seminar hours per week. Spring. Staff.

191 OVERVIEW OF AGING AND CHRONIC ILLNESS (PHNU 216) (3). Provides an understanding of the theories and issues related to the biological, physical, emotional, demographic, and social aspects of aging, including population-based risk factors, with emphasis on health promotion. Spring. Staff.

200, 201, 202, 203, 204 SPECIAL STUDIES IN BEHAVIOR CHANGE (1 or more). Prerequisite, permission of the instructor: HBHE 200 - natural change process in health-related behavior; HBHE 201 - planned change; personal and non-personal methods; HBHE 202 - program design and evaluation; HBHE 203 - personal development and community action; HBHE 204 - social class and culture variations in planned change. Fall, spring, and summer. Staff.

208 HEALTH ISSUES OF U.S. POPULATIONS OF COLOR (3). This course explores the various structural forces that impact the health status and health behaviors of populations of color in the United States. Three lecture hours per week. Fall. Bani.

210 COMMUNITY CAPACITY, COMPETENCE, AND POWER (3). The nature and delineation of participatory action research and its relevance to concepts, principles, and practices of community empowerment. Students learn methods, such as photovoice, through learning projects. Spring. Eng.

211 POLICY ADVOCACY FOR HEALTH EDUCATION (1-3). Health education policy roles as a unit of health education practice, includes following a bill through the N.C. State Legislature or other policy-making body. One to three lecture hours per week; one to three lab hours per week. Staff.

225 HEALTH COMMUNICATION THEORY AND RESEARCH (3). Prerequisite, HBHE 130. Permission for nonmajors. Overview of communication theory and research and critical analysis of applications of communication theory to health education and health behavior intervention. Lecture-discussion format three hours per week. Fall. Jackson.

230 PUBLIC POLICY AND THE POLITICS OF HEALTH (HPAA 262, NURS 353) (3). The course objectives are to identify an ecological view of modern health problems and its implications for health policy development and to analyze the effectiveness of major health promotion strategies. Spring. Milo.

231 ANTHROPOLOGY AND PUBLIC HEALTH: CRITICAL PERSPECTIVES ON RESEARCH AND PRACTICE (2). The course is for students who want to gain critical tools designed to improve analytical policy and cultural skills. Public health topics include AIDS, global health, reproductive health, cancer, violence prevention, and federal public health goals. Fall. Staff.

232 HEALTH, DEVELOPMENT AND TECHNOLOGY (3). Critical analysis of the theories in and approaches to adult learning, economic development, technology transfer, and primary health care. Nonformal education and community organization techniques for integrating health and development in the rural United States and in developing countries. Spring. Eng.

233 INTRODUCTION TO PROGRAM MANAGEMENT (3). An introductory overview of health education program management. A practical study of personnel and financial management issues including: staff development, recruitment, performance appraisal, budget preparation, and monitoring. Three lecture hours per week. Fall. Crump.

234 HEALTH EDUCATION METHODS AND STRATEGIES (3). This participatory course uses lecture, role-playing, panel discussions, and other group processes to explore various methods used in health promotion and disease prevention programs to affect health behavior. The course will examine ways of tailoring these methods to different settings and populations in which health educators work. Fall. Bani.

240 FOUNDATIONS OF HEALTH EDUCATION PRACTICE (2). Historical and critical examination of public health and health education professions and major paradigms that inform our research and planning approaches. Students acquire skills needed for research and practice. Two lecture hours per week. Fall. (Field fee $600.) Eng.

241 ACTION ORIENTED COMMUNITY DIAGNOSIS (4). Prerequisite, HBHE 240. Student teams work under field preceptors to acquire analytic and empowerment education skills in real world context for engaging communities and service providers in examining social determinants of health. Four lecture hours per week. Spring. Eng.

242 PROGRAM INTERVENTION, IMPLEMENTATION, AND MONITORING I (2). Prerequisite, HBHE 241. Methods for executing health education intervention plans, including monitoring effectiveness and making appropriate modifications. Students work under faculty advisories to collaborate with local agencies and implement the plans of action developed in HBHE 241. Six lecture hours per week. Fall. Eng.


244 RESEARCH PRACTICUM I (2). Research option: Students must complete a mentored research practicum. The mentor and student will develop a contract to
achieve their research objectives and the means of evaluating an intervention or testing a hypothesis. The practicum requires a total of 200 hours of work starting in the second year of the program. Summer Jackson.

245 RESEARCH PRACTICUM II (2). Research options: After completing the data collection and analysis component of the practicum, students write up their findings into a publishable manuscript. Spring. Jackson.

246 PUBLIC HEALTH PROGRAM PLANNING AND EVALUATION (HPAA 246, MHCH 246, PBNU 246, PUBH 246) (2-4). Fundamentals of public health program planning and evaluation with emphasis on 1) applications in neighboring communities and 2) writing proposals for project funding. Three lecture hours and one lab hour per week. Staff.

250 APPLIED RESEARCH METHODS IN HEALTH BEHAVIOR AND HEALTH EDUCATION (4). Prerequisite for nonmajors, permission of the instructor. Research methods of relevance to planned change in health-related behavior and program planning. Research designs include quantitative and qualitative methods and focus on application to public health practice. Four lecture hours per week. Fall. Foshay.

251 THE ROLE OF EVALUATION IN HEALTH EDUCATION (2). Prerequisite, HBHE 250. Emphasis on methods to show the importance of evaluation in health education program planning and developing skills in formative evaluation design, emphasizing analysis of data contributed to decision making regarding programs. Two lecture hours per week. Spring. Foshay.

252 INTERVENTION METHODS IN HEALTH EDUCATION (4). Critical examination of major intervention methods used in health promotion and disease prevention programs, and ways to tailor these methods to different settings and populations in which health educators work. Four seminar hours per week. Spring. Staff.

253 QUALITATIVE EVALUATION AND RESEARCH METHODS (NUTR 354) (3). Prerequisite, HBHE 250 or equivalent. Theoretical and methodological approaches of applied medical anthropology for health program development and evaluation. Field methods for collecting and analyzing data through observation, interviewing, group methods and case studies. Spring. Steckler and Bentley.

255 INTRODUCTION TO NONFORMAL EDUCATION FOR HEALTH PROFESSIONALS (3). Development of students' comprehension of current research on adult education principles, and the development of practical training skills that can be used to teach and to supervise community health workers. Three lecture hours per week. Staff.

260 RESEARCH METHODS (3). Permission for master's students and nonmajors. An intermediate-level course providing comprehensive coverage of behavioral science research methods as applied to health behavior and health education problems. Topics include problem formulation, design, sampling, measurement, analysis, and interpretation. Three lecture hours per week. Spring. Jackson.


295 THE INTERNET AND PUBLIC HEALTH: PROMISES AND PEIRLS (3) An overview of the positive and negative impacts of the Internet on public health. Covers research, evaluating sites, ethics and use of technology that addresses key public health problems. Fall. Ribisl.

300 SOCIAL PSYCHOLOGICAL THEORIES OF INDIVIDUAL HEALTH BEHAVIOR (3). Prerequisite, HBHE 130 or permission. Selected social psychological theories and their relationship to health promotion, disease prevention, and patient education. Three lecture hours per week. Spring. DeVeils.

301 TOPICS IN SOCIOLOGY OF HEALTH (3). Prerequisite, HBHE 130 or 131. Permission required for non-majors. Health issues will be analyzed using sociological approaches in order to determine the research needs to develop more informed social policy. Implementation for practice will be discussed. Fall. (Alternate years) Staff.

302 SOCIAL DETERMINANTS OF HEALTH: THEORY, METHOD, AND INTERVENTION (EPID 280) (3). Prerequisite, EPID 160. Discussion and readings will focus on population vs. individual perspectives on health, risk conditions vs. risk factors, concepts of causation, and knowledge development as an historic and social process, and will examine macro-level determinants of population health. Fall. Daniel.

303 SOCIAL RELATIONSHIPS AND HEALTH (3). Prerequisite, EPID 160 or equivalent. Introduces students to epidemiological evidence that links social relationships with health outcomes, theoretical and empirical work that attempts to link the association between social relationships and physical health. Spring. Lewis.

310 DOCTORAL SEMINAR: HISTORICAL AND CONCEPTUAL BASES OF PUBLIC HEALTH (3). This seminar examines the historical and conceptual bases of public health and health education and considers ideological and ethical implications for public health research, policy, and programs. Three lecture hours per week. Runyan.

311 DOCTORAL SEMINAR: DEVELOPMENT OF HEALTH PROMOTION AND DISEASE PREVENTION INTERVENTION (3). The goals of this seminar are to explore the problems and issues in using behavioral and social science theories, concepts, and data to inform HBHE research and interventions. Three lecture hours per week. Sorenson.

312 DOCTORAL SEMINAR: PROFESSIONAL ISSUES (3). Topics related to optimal functioning as a doctorally prepared professional, including writing and reviewing grants, manuscripts, abstracts; consulting; credentialing; teaching; job search, ethics, collaboration, fraud, and politics in research. Three lecture hours per week. DeVellis.

313 DOCTORAL SEMINAR: MODELS OF HEALTH EDUCATION PRACTICE (3). The purpose of this seminar is to describe, critically analyze, and compare a variety of health education practice models, e.g., social change model, PRECEDE/PROCEED stage model of diffusion, and others. Three lecture hours per week. Eng and Steckler.

317 ADVANCED TOPICS IN HEALTH BEHAVIOR AND HEALTH EDUCATION (1-3). For doctoral students who pursue independent study or research in a selected field. Students work with faculty to design the study. Staff.

340, 341, 342, 343 ADVANCED FIELD TRAINING IN HEALTH EDUCATION (3). Under guidance by faculty and field counselors, students assume major responsibility for planning, executing, and evaluating community health education projects. Open to doctoral students in the department. Field fee $125. Fall and spring. Staff.

350 SECONDARY DATA ANALYSIS (3). Prerequisite, BIOS 145 or equivalent and permission of the instructor. This seminar is designed to refine a wide range of research skills in health behavior and health education by using data collected by others. Three seminar hours per week. Spring. (Alternate years) Foshay.

351 CAUSAL MODELING AND STRUCTURAL EQUATIONS (3). Prerequisite, BIOS 145 or equivalent and permission of the instructor. Focus on causal modeling and strategies for analyzing such models including LISREL analysis. Secondary data is available for course assignments. Three lecture hours per week. Spring. (Alternate years) Staff.

352 SCALE DEVELOPMENT METHODS (3). Prerequisite, HBHE 250 or equivalent, and permission of the instructor. Covers theory and application of scale development techniques for measuring latent constructs in health research; classical measurement theory and factor analytic methods are emphasized. Three seminar hours per week. Spring. R. DeVellis.
353 ADVANCED EVALUATION OF HEALTH INTERVENTION PROGRAMS (3). Prerequisites: BIOS 145, HBE 250, or equivalent, and permission of the instructor. Emphasis is on methods required to complete various types of analysis related to program implementation (e.g., efficacy of programs in terms of objectives, cost-benefit analysis, utility analysis). Both quantitative and qualitative methods are covered. Three seminar hours per week. Fall. (Alternate years.) Earp.

392 MASTER'S PAPER (Vac). Fall, spring, and summer. Staff.

393 MASTER'S THESIS (3-6). Fall, spring, and summer. Staff.

394 DOCTORAL DISSERTATION (3-9). Fall, spring, and summer. Staff.

DEPARTMENT OF HEALTH POLICY AND ADMINISTRATION (HPAA)
KERRY E. KILPATRICK, Chair

Professors
Richard N. L. Andrews (117) Environmental Policy
Jeffrey L. Houpt (284) Health Policy, Mental Health
Sagar C. Jain (1) International Health, Population and Family Planning, Human Resources Management and Development, Culture and Managerial Behavior
Arnold D. Kaluzny (15) Organizational Design and Behavior, Program Implementation and Evaluation
Joseph Lipscomb Jr. (288) Health Outcomes Research, Health Economics, Health Care Workforce
Donald L. Madison (16) Medical Care Organization, History of Medical Care
Curtis P. McLaughlin (61) Financial Management, Cost-Effectiveness, Health Administration Research
Nancy Milio (51) Public Policy and Health Promotion, International Health, Thomas C. Rickerts (139) Rural Health Care, Primary Care, Regionalization of Services, Political Philosophy, Policy Implementation and Policy Development
William L. Reper (239) Outcomes Research, Health Policy, Managed Care
Richard Gary Rozier (29) Dental Public Health
Morris Weinberger (300) Quality Management, Health Outcomes Research, Health Services Research
William N. Zelman (62) Health Care Financial Management, Activity-Based Costing, Cost of Quality, Instructional Design, Quality Improvement

Associate Professors
James E. Allen (11) Long-Term Care Administration, U.S. Health Policy, Aging, Nursing Home Administration
Andrea K. Biddle (175) Health Care Access and Reform, Childhood Vaccination, Pharmaceutical Economics
Laurel A. Files (28) Organization Design and Change, Strategic Planning
Bruce J. Fried (172) Human Resources Management in Health Care, Mental Health Services Research, Health Services Management and Education, Canadian Health Systems
Edward C. Norton (211) Health Care Economics, Long Term Care and Aging, Managed Care, Econometrics and Statistics
Sally C. Stearns (150) Health Economics, Health Policy

Assistant Professors
Marisa E. Domino (279) Health Economics
William H. Dow (260) Health Economics and Policy
Shiou-Yih Daniel Lee (301) Medical Care Organization
Felicia Melance (302) Media Communications of Health Policy, Health Policymaking, and Public Opinion

Bryan J. Weiner (277) Organization and Management of Community Health Partnerships

Clinical Professors
Thomas J. Bacon (24) Population Studies, Rural Health
Deborah E. Bender (163) International Health, Maternal and Child Health Services, Community-Based Health Program Planning
Carmen Hooker Buell (219) Urban Studies, Health Care Legislation, Health Care Data
Gordon H. DeFries (137) Health Services Research

Clinical Associate Professors
Edward F. Brooks (128) Research Management, Rural Health Care Delivery, Health Manpower
Dean M. Harris (195) Health Law and Ethics for Health Administration
Janet E. Porter (252) Health Administration Practice
Pamela Silberman (249) Public Health Legal Issues

Clinical Assistant Professors
Oscar R. Ayler (268) Healthcare Administration Programs
Benjamin Gilbert (53) Health Policy, Health Law, Legislative Process
James V. Porto (134) Management and Information Systems, Public Budgeting and Finance
Vaughn M. Upham (261) Public Health Administration Leadership

Clinical Instructors
Gary S. Palmer (217) Health Services Administration, Managed Care
Robert C. Schreiner (106) Information and Control Systems
Sarah L. Strunk (266) Alumni Affairs/Community Service Programs

Research Professors
Thomas R. Konrad (69) Research Methodology
William A. Selviento (262) Health Research Methodology
Research Assistant Professors
Kathleen Dalton (297) Health Care Financing, Health Services Research, Academic Medical Centers
Julie J. Mohr (299) Quality Assurance and Assessment
Sue Tolleson Rinehart (293) Health Outcomes Research, Political Science, Women's Issues
Lucy A. Savitz (212) Strategic Planning, Marketing, Health Systems Management

Adjunct Professors
William K. Atkinson (255) Health Care Administration
James D. Bader (119) Dentistry
Marc L. Berger (289) Clinical Research and Development
Fred T. Brown Jr. (282) Managed Care Networks
Charles Robert Buck Jr. (296) Health Care Quality
William H. Campbell (206) Pharmacy Administration
Dale B. Christensen (267) Pharmacy Health Services
Jan P. Clement (189) Health Care Financial Management
Harvey J. Cohen (274) Geriatric Medicine
John R. Feussner (161) Health Policy and Administration
Patrick M. Flynn (225) Drug Abuse Programs
Deborah A. Freund (75) Health Economics, Health Policy
Abraham G. Hartzem (109) Pharmacy Administration
H. Garland Hershry Jr. (256) Dental Public Health
William F. Jesse (76) Medical Group Management, Health Care Quality and Outcomes
Mary G. Kovan (147) Aging, Health Policy
Sheila Leatherman (286) Health Care Quality and Outcomes, International Health, Health Services Research
Kathleen N. Lohr (246) Health Care Policy Research
Joseph P. Morrissey (138) Health Services Research, Administrative Medicine, Community Mental Health
Eric B. Munson (92) Hospital Administration
Harry A. Nurnik (208) Health Services and Hospital Administration
Dennis A. Revicki (209) Quality of Life Measures in Pharmaceutical Economics Research
Hugh H. Tilson (81) Health and Human Services, Preventive Medicine

Adjunct Associate Professors
Deborah A. Amaral (210) Environment
Mary A. Beck (164) Health Care Administration
Stephen M. Downs (283) Pediatric Research
Steven A. Garfinkel (292) Health Services Research and Managed Health Care Plans
James W. Luckey (777) Alcohol, End User Computing
David B. Marchar (158) Health Services Research, Medical Decision Analysis
Michael S. O'Malley (235) Health Services Oncology Research
Robert C. Simon (273) Health Care Management
Betsy L. Slezak (254) Pharmacy Administration
Steven G. Sloat (228) Health Policy and Administration
Wendie M. Wechsberg (291) Clinical Addiction and Drug Treatment, HIV Projects

Adjunct Assistant Professors
Jim P. Doberty (287) Health Outcomes and Treatment of HIV/AIDS
David A. Goff (294) Health Care, Health and Human Services Medical Assistance
Brian Goldstein (278) Health Care Financial Management
Susan L. Hogue (250) Health Outcomes Research
Frederick K. Homan (236) Health Policy and Administration
David C. Kibbe (96) Quality Management
Stephen N. Orton (259) Distance Learning
David D. Potenziani (238) Management Information Systems in Health Care
Donna J. Rabiner (231) Health Policy and Administration
Richard F. Scoville (272) Management Information Systems in Health Care
Kathleen C. Thomas (295) Health Economics
Courtney H. Van Houven (306) Informal Care and Elderly Health Care Use
Thomas A. Walker (280) Health Economics
James W. Yarbrough (275) Management Information Systems in Health Care

Adjunct Instructors
Dawn Carter Buckner (281) Strategic Planning and Marketing
Aidan M. Collins (270) Management Information Systems in Health Care
Michael L. Freeman (265) Strategic Planning and Marketing
Noah D. Gluck (238) Health Policy and Administration
Sarah F. Jaggar (240) Health Policy and Administration
Douglas A. Johnston (174) Health Law
Lawrence K. Mandelker (244) Database Design for Health Care
Daniel B. Reiner (152) Health Policy and Administration
Diana E. Ricketts (203) Health Law
Margaret S. Thomas (276) Health Care Financial Management

Adjunct Lecturers
David S. Abernethy (215) Health Reform Proposals, Policy Development
Kathryn B. Ahlport (216) Organizational Design and Behavior
Majorie A. Satinsky (250) Health Policy and Administration

Professors Emeriti
James F. Dixon
Patricia Z. Fischer
William S. Flath
William T. Herroz
Jacob C. Kooremen
Robert A. Loddfors
Harry T. Phillips
Morris Schaefer

Executive Master's Program
The Department of Health Policy and Administration provides graduate-level education to employed health professionals and health administrators through its Executive Master's Program.

The North Carolina East and West Programs provide graduate education in health administration for North Carolina health professionals holding full-time jobs. This program offers classes one full day per week at several off-campus sites during fall/spring semesters with short summer visits to Chapel Hill. Students complete the M.P.H. within two years and the M.H.A. requirements within three years.

The National Program provides master's degree study to full-time health professionals throughout the United States and beyond. It comprises an Internet Distance Learning format with on-campus visits (three eight-day sessions) at Chapel Hill annually. Students usually complete the M.P.H. degree requirements within two years, and the M.H.A. requirements within three years.

Program information may be obtained by calling (919) 966-7359 or (919) 966-7364, or by writing The Executive Master's Program, Department of Health Policy and Administration, School of Public Health, CB# 7411, McGraw-Greenberg Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7411. E-mail: emp@unc.edu. Fax: (919) 843-4980. Web: www.phs.unc.edu/hpaa. Applications can be completed on-line or downloaded from the home page.

Courses for Graduates and Advanced Undergraduates

101 INFORMATION MANAGEMENT IN HEALTH POLICY AND ADMINISTRATION (3). Introduces students to methods for critically evaluating public health literature and using computers to identify, file, and retrieve information. Fall. Staff.

102 CONCEPTS OF HEALTH ADMINISTRATION (3). Survey of health and human services organization and management, including concepts of administrative systems, government, legal and public interest aspects, organizational behavior and relations. Spring. Staff.

104 ISSUES IN MANAGING HEALTH CARE ORGANIZATIONS (Var.). Through presentations of leaders in the health care field and class discussion, problems, issues, and changes in health care policy and administration are explored. Spring. Porto.

105 ISSUES IN HEALTH POLICY (1-3). Lectures on current topics in the area of health policy. Spring. Staff.

106 ISSUES IN HEALTH CARE (1-2). Lectures on current topics in the area of health care. Fall. Fried. Aylor.

107 THEORY AND PRACTICE OF PUBLIC HEALTH POLICY AND ADMINISTRATION (3). Policy and management issues and ideas, including their historical derivations and international implications, in relation to current state and local practice. Fall and spring. Staff.

109 CONCURRENT FIELD TRAINING IN HEALTH POLICY AND ADMINISTRATION (1-6). Supervised observation or service activities in health service organizations. Fall and spring. Staff.

110 INTERNATIONAL AND COMPARATIVE HEALTH ADMINISTRATION (3). Prerequisite, permission of the instructor. International career interests desirable. Study of various health problems and responsive program systems in different (more or less developed) countries, with a comparative framework, examining special experiences, general lessons, and possibilities for cooperation. Fall. Veney, Jain.

119 INTRODUCTION TO HEALTH POLICY AND ADMINISTRATION (2). Provides an overview of the United States health system, emphasizing role of policy development and administrative decision making through case examples. Fall, spring. Upshaw.

120 ACCESS AND QUALITY OF CARE FOR LATINO POPULATIONS (1-3). Prerequisite, intermediate level Spanish and permission of the instructor.
121 HOSPITAL ORGANIZATION AND ADMINISTRATION (3).
Comprehensive overview of general hospitals, including organizational structure, governance, medical staff, external relationships, departmental organization, strategic planning, financing, regulation, accreditation, quality assessment. Addressed from perspective of chief executive officer. Fall. Staff.

122 LONG-TERM CARE ADMINISTRATION I (3).
Introduction to administration of long-term care facilities. Evolution of long-term care, survey of the current field, examination of state and national requirements. Fall. Allen.

123 LONG-TERM CARE ADMINISTRATION II (3).
Prerequisite, HPAA 122 or permission of the instructor. Nursing home care, organization monitoring, costs, and financing. Exploration of trends and issues such as cost controls, productivity, quality assurance, medical staffing, and organization. Spring. Allen.

124 LONG-TERM CARE AND AGING POLICY ISSUES (3).
Long-term care and aging policy in the United States from the early 1960s through the late 1990s will be reviewed along with Medicare, Medicaid, and public/private long-term policies. Spring. Rabiner.

125 MANAGED CARE, MARKET REFORM, AND THE IMPACT ON VULNERABLE POPULATIONS (3).
Students will gain an understanding of how the changes in the health care market affect care for underserved populations, and will develop strategies to ensure that the needs of these populations are met. Fall, spring. Silberman.

126 PHYSICIAN PRACTICE MANAGEMENT (3).
Course targets students interested in a health care career. Topics include: structure of group practices, governance/ownership, risk management, malpractice, physician compensation, operational and financial management.

127 INTRODUCTION TO DENTAL PUBLIC HEALTH (3).
Prerequisite, permission of the instructor. Survey of the theory and practice of dental public health with an emphasis on basic knowledge and skills necessary for planning and evaluating dental public health programs. Fall. Rozier.

128 PHARMACEUTICAL RESEARCH, DEVELOPMENT, AND MARKETING (PHAD 180) (3).
This course acquires future regulators, policy analysts, and corporate managers with the internal and external environments influencing decision making and management in the discovery, development, and marketing of pharmaceuticals. Fall. Norwood.

130 ORGANIZATIONAL DESIGN AND BEHAVIOR OF HEALTH INSTITUTIONS (3).
Overview of organizational theory and empirical findings appropriate to the design and behavior of health care organizations. Topics include the design of the organization, its performance, and relationship to the environment. Spring. Kaluzny.

140 READINGS IN HEALTH POLICY AND ADMINISTRATION (1-6).
Staff.

141 MARKETING FOR NON-PROFIT ORGANIZATIONS (3).
Prerequisite, permission of the instructor. Application of basic principles of marketing and marketing decision models to problems in health care and other non-profit organizations. Spring. Staff.

142 OPERATIONS RESEARCH FOR HEALTHCARE SYSTEMS (3).
Prerequisite, BIOS 110 and permission of instructor. Review of the systems analysis process in healthcare systems. Deterministic and random models, mathematical programming, queuing, simulation, forecasting, and measurement. Emphasis on model formulation and computer solution of decision models.

144 STATISTICAL METHODS FOR HEALTH POLICY AND ADMINISTRATION (3).
Knowledge of basic descriptive statistics required. Topics include probability theory, probability distributions, estimation tests of hypotheses, chi-squared procedures, linear regression and correlation. Introduction to a linear model approach to the analysis of data in health care settings, including introductory methods in multiple regression, and analysis of variance and covariance. Fall, spring, and summer. Veney, Van Houven.

145 INTRODUCTION TO STRATEGIC PLANNING AND MARKETING (3).
Prerequisite, permission of the instructor. An introduction to the philosophy and methods of strategic planning in health care systems. Related disciplines include marketing, management, organizations, systems, and decision analyses. Spring. Carter.

155 INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS IN HEALTH CARE (3).
Conceptual and practical aspects in the analysis, development, and utilization of computer-based information and control systems with emphasis on application to the health care environment. Spring. Yarbrough.

157 DATABASE DESIGN FOR HEALTH CARE APPLICATIONS (3).
Prerequisite, permission of instructor. Hands-on introduction to the design and implementation of relational databases to manage and analyze health care data using Microsoft Access. Includes design of fully automated databases as well as the use of Access as an analysis tool in conjunction with Microsoft Excel. Fall. Mandelker.

161 STRATEGIES FOR PREVENTION (3).
This course discusses the effects of public policies for prevention on rates of illness, injury, and premature death. Fall. Staff.

163 GERIATRIC HEALTH AND MEDICAL CARE (3).
Presents a comprehensive survey of geriatric health and medical care from both a clinical and policy perspective. Spring. Staff.

164 HEALTH POLICY AND AGING (HHBE 164) (3).
Prerequisite, permission of the instructor. Critical examination of aging policy in light of empirical findings on the elderly's economic power. Utilization patterns, prevalence of dependency, and the cost-effectiveness of policy options, including long-term care. Spring. Staff.

170 ECONOMIC PERSPECTIVES IN HEALTH POLICY AND ADMINISTRATION (3).
Prerequisite, ECON 10 or permission of the instructor. An introduction to health economics principles as applied to major sectors of the United States health care delivery system. Spring, summer. Kilkpatrick.

176 INTRODUCTION TO HEALTH SERVICES RESEARCH (3).
Prerequisite, MPH 100. Provides systematic introduction to selected methods for health services research, health services research literature, and research writing. Fall and spring. Staff.

185 ETHICAL ISSUES IN HEALTH POLICY AND ADMINISTRATION (3).
Introduction to ethical issues in health care including rationing, managed care, clinical research, organizational ethics and compliance programs, administrative ethics, and bio-ethical issues such as assisted suicide. Spring. Harris.

190 PSYCHOSOCIAL ASPECTS OF AGING (HHBE 190) (PHNU 190) (3).
Prerequisite, permission of the instructor. Psychosocial aspects of the aging process and of old age. Needs of the elderly and their reactions to agencies and programs for the aged. Spring. Staff.

198 SEMINAR IN HEALTH OUTCOMES RESEARCH I (1).
Fall. Tossenson-Rinehart.

199 SEMINAR IN HEALTH OUTCOMES RESEARCH II (1).
Spring. Tossenson-Rinehart.

Courses for Graduates Only

201 PROFESSIONAL TRAINING I (Var.). Prerequisite, HPAA major. Supervised professional training. Fee is $550.00. Fall. Fried.

202 PROFESSIONAL TRAINING II (Var.). Prerequisite, HPAA major. Supervised professional training. Fee is $500.00. Fall. Fried.
203 PROFESSIONAL TRAINING III (Var.). Prerequisite, HPAA major. Supervised professional training. Fee is $500.00. Spring. Fried.

204 MANAGEMENT PRINCIPLES AND PRACTICES (3). Provides an overview of knowledge and skills required for effective health services management. Aimed primarily at individuals who plan on assuming management roles in health services and related fields. Fall. Fried.

207 APPLICATION OF HEALTH MANAGEMENT METHODS I (Var.). Prerequisites, completion of fall courses and permission of the director of the executive program for South Asia. Students carry out field project to test applicability, feasibility, and validity of theories and methods learned in classroom through analysis and resolution of a health policy/management issue. Fall. Jain.

208 APPLICATION OF HEALTH MANAGEMENT METHODS II (Var.). Prerequisites, completion of spring courses and permission of the director of the executive program for South Asia. Students carry out field project to test applicability, feasibility, and validity of theories and methods learned in classroom through analysis and resolution of a health policy/management issue. Spring. Jain.

209 FIELD WORK IN HEALTH POLICY AND ADMINISTRATION (Var.). Prerequisite, HPAA major. Supervised field experience in approved health agencies. (Field fee $450.) Summer. Staff.

210 MANAGEMENT OF FOREIGN AID IN HEALTH AND POPULATION (3). Prerequisites, HPAA 240 and 110, or permission of the instructor. The course examines selected policy and management issues in foreign assistance from the point of view of both the donors and the recipients. Spring. Jain.

211 HEALTH AND POPULATION POLICY AND PROGRAM DEVELOPMENT (3). Prerequisites, BIOS 170, SOCI 212, or equivalent, or permission of the instructor. Population policy concepts and processes; policy implications of population dynamics; program implementation issues, especially family planning program strategies, design, and evaluation; relating to the United States and developing countries. Fall, spring. Jain.

212 INTERNATIONAL COOPERATION IN HEALTH AND POPULATION (2). Prerequisite, HPAA 110 or equivalent, or permission of the instructor. Roles, problems, and opportunities for different kinds of international organizations in health and population fields. Reference to general development context; organizational relationships; various subject areas; and methods of cooperation and assistance. Spring. Staff.

213 FIELD WORK IN HEALTH POLICY AND ADMINISTRATION II (Var.). Supervised field experience in approved health agencies. Summer. Fried.

216 OVERVIEW OF AGING AND CHRONIC ILLNESS (HBHE 191) (PHNU 216) (NUTR 216) (3). Prerequisite, permission of the instructor for advanced undergraduates only. Provides a sound understanding of the theories and issues related to the biological, physical, emotional, demographic, and social aspects of aging, including population-based risk factors, with emphasis on health promotion. Fall. Norburn, Kincaid.

220 EVOLUTION, ORGANIZATION, AND FINANCING OF THE U.S. HEALTH SYSTEM (3). The course objectives are to provide students with basic knowledge of trends, issues, and existing systems of health care delivery within the United States. Fall. Upshaw, Brooks.

221 ORGANIZATION AND ADMINISTRATION OF MULTIHOSPITAL SYSTEMS (3). Prerequisite, HPAA 121 or permission of the instructor. Legal, financial, and organizational issues of multihospital systems development and management, including issues of corporate reorganizations, strategic planning, and marketing. Prototypes and operating examples are considered. Spring. Staff.


223 MANAGEMENT OF NONPROFIT ORGANIZATIONS (3). Principles and advanced topics in the management of nonprofit organizations. Spring. McLaughlin.

227 DENTAL PUBLIC HEALTH PRACTICE (3). Prerequisite, permission of the instructor. Emphasis on knowledge of community measures for prevention and control of oral diseases, understanding the scientific basis for their use, and designing and evaluating prevention programs for a specific population. Spring. Rojet.

228 ORAL EPIDEMIOLOGY FOR HEALTH POLICY AND ADMINISTRATION (3). Prerequisites, HPAA 127, EPID 160, or permission of the instructor. Focuses on the epidemiology of oral diseases and the implications and uses of this knowledge for dental health policy making and administration of dental programs. Spring. Rojet, Arbes.

230 MANAGEMENT OF HUMAN RESOURCES IN HEALTH ORGANIZATIONS (3). Prerequisite, HPAA 130 or permission of the instructor. Emphasis is on clarifying concepts of human resources management and identifying the importance of human resources in health organizations. Fall. Fried.

231 ORGANIZATION ASSESSMENT AND DIAGNOSIS (3). Prerequisite, HPAA 130. This course explores alternative models and approaches for assessing structural and process characteristics of health service organizations. Fall. Kavazanj.


233 MANAGEMENT OF ORGANIZATIONAL CHANGE (3). The objective of this course is to improve competence in analyzing health organizations and managing planned change. Fall and spring. Fles, Thomas.

234 LEADERSHIP AND SUPERVISION (3). Diagnostic techniques for identifying and correcting organizational pathology is primary focus of this course. Roles of personnel, organizational, and environmental factors are examined, and manipulation strategies discussed. Spring. Jain.

235 HEALTH MANPOWER PLANNING (3). Prerequisites, HPAA 240 and 247. Course covers methods of assessing health manpower needs and for developing a realistic strategy and plan for meeting these needs. Experiences of various countries are examined. Spring. Hall.

236 DEMOGRAPHY FOR HEALTH POLICY AND MANAGEMENT (3). Methods of assessing and utilizing demographic data for determining service needs and priorities and for other policy and management decisions. Fall. Srinivasan.

240 HEALTH ADMINISTRATION AND PLANNING I (3). This course provides an overview of the concepts, processes, and methods used in policy analysis, strategic planning, and management in the health care sector. Fall and summer.莱特.

241 OPERATIONS RESEARCH FOR HEALTH CARE SYSTEMS (3). Prerequisite, BIOS 110 and permission of the instructor. Review of the systems analysis process in health care systems. Deterministic and random models, mathematical programming, queuing, simulation, forecasting, and measurement. Emphasis on model formulation and computer solution of decision models. Spring, summer. Kilpatrick.

242 ADVANCED OPTIMIZATION METHODS IN HEALTH POLICY AND ADMINISTRATION (3). Prerequisite, HPAA 241 or permission of the instructor. Analysis of complex deterministic models and their applicability to health services research. Formulation of models for solving health care decision problems, involving mathematical programming, and heuristics. Spring, alternate years. Staff.

243 STOCHASTIC PROCESSES IN HEALTH POLICY AND ADMINISTRATION (3). Prerequisite, HPAA 241 or permission of the instructor. Modeling and analysis of random processes in health care systems. Markov and queuing models, simulation of complex stochastic systems, experimental design, and output analysis. Spring. Kilpatrick.
244 SYSTEMS SIMULATION FOR HEALTH SERVICES (3). Prerequisite, HPAA 241 or permission of the instructor. Course will prepare students to simulate health services using the MedModel simulation software. Fall. Kilpatrick.

245 PROGRAM EVALUATION (3). Prerequisite, HPAA 241 or permission of the instructor. Concepts and methods of the program evaluation paradigm as applied in health administration; experiential learning of evaluation planning, design, and implementation. Spring. Bender, Veney, Konrad.

246 PUBLIC HEALTH PROGRAM PLANNING AND MONITORING (PBHU 246, MHCH 246, HBHE 246) (2-4). Prerequisite for nonmajors, permission of the instructor. Fundamentals of public health program planning and monitoring with emphasis on 1) applications in community settings and 2) proposal development for program funding. Spring. Bender, Fosher, Eng.

247 METHODS FOR HEALTH PLANNING AND PROGRAMMING (3). Course teaches how to use existing information and collect new information needed for effective planning and management, with special emphasis on community diagnosis, need determination, and program environment assessment. Fall. Neumann.

248 STRATEGIC COMMUNITY HEALTH PLANNING (3). Prerequisite, HPAA 247. This course focuses on goal setting, strategy development, and plan preparation with special attention to resource allocation monitoring and control. Fall. Talukdar.

249 IMPLEMENTATION AND OPERATIONS MANAGEMENT (3). Prerequisite, HPAA 240. Strategic management (planning) in health care organizations in the context of institutional governance, professional groups, and regulatory environments. Spring. McLaughlin.

250 INTRODUCTION TO HEALTH CARE FINANCIAL MANAGEMENT (3). Prerequisite for nonmajors, permission of the instructor. A broad introduction to financial concepts, issues, tools, and vocabulary. Topics include: financial statement analysis, working capital management, budgeting, cost finding, and rate setting. Minimal accounting proficiency expected. Fall, summer. Zelman, Thomas.

251 MANAGEMENT ACCOUNTING FOR HEALTH ADMINISTRATORS (3). Prerequisite, HPAA 250 or permission of the instructor. Covers selected topics in managerial accounting applied to health care. It is intended to provide in-depth coverage of managerial topics introduced in HPAA 250. Spring. Zelman.

252 LONG-TERM FINANCIAL MANAGEMENT OF HEALTHCARE ORGANIZATIONS (3). Prerequisite, HPAA 250. Advanced financial management concepts and practices in health service organizations, including: working capital management, capital markets, capital structure, capital budgeting, and reimbursement implications. Fall. Zelman, Pink.

253 SHORT-TERM FINANCIAL MANAGEMENT OF HEALTHCARE ORGANIZATIONS (3). Prerequisite, HPAA 250 or permission of the instructor except for HPAA students. Analysis of topics of current interest in financial management of healthcare organizations. May include project selection, endowment stewardship, access to capital. Spring. Staff.

260 INTRODUCTION TO HEALTH POLICY AND POLITICS (3). Prerequisite, HPAA 220 or permission of the instructor. This course addresses the major political institutions and policy processes that shape health policy, principally at the federal level. Spring. Rickert.

261 MEDIA AND HEALTH POLICY (3). Prerequisite, HPAA 220 or equivalent. Permission of instructor is required for graduate students who have not taken HPAA 220. Introduces students to news media organizations and their role in health policy development. Students will learn how to evaluate media content and strategies and to effectively communicate via mass media. Spring. Mebane.

262 HEALTH AND POLICY (HSHE 230) (NURS 333) (3). The course objectives are to identify an ecological view of modern health problems and its implications for health policy development and analyze the effectiveness of major health promotion strategies. Spring. Milita.


264 MEASUREMENT METHODS AND APPLICATIONS IN HEALTH CARE QUALITY (3). Prerequisite, HPAA 220. Methods and practices for quality control and assurance in health care organizations. Spring. Weinberger.

265 HEALTH POLICY ISSUES ANALYSIS (3). Prerequisite, HPAA 220 or permission of the instructor. A framework for analysis is developed and applied to three major health policy issues, e.g., medical care rationing, role of public health, or technology assessment. Fall. Staff.

266 POLICY AND ECONOMICS OF PHARMACEUTICAL DISTRIBUTION (PHAD 201) (3). Prerequisite, HPAA 220 or equivalent and permission of instructor. Regulatory policy and the U.S. drug distribution system including prescribers, payers, and the retail pharmacy industry are examined with regard to structure and performance of the distribution system. Spring. Staff.

267 ECONOMICS AND BEHAVIOR OF THE INTERNATIONAL PHARMACEUTICAL INDUSTRY (PHAD 251) (3). Provides an economic perspective on such issues as industry structure, regulation, pricing, research and development, product innovation, patient policies, and profitability. Spring. Shih.

268 ECONOMIC EVALUATION OF HEALTH CARE TECHNOLOGY (PHAD 252) (3). Focus is on determination of costs and benefits associated with alternative resource allocation schemes. Crucial economic concepts (e.g., utility valuation of health states and marginal analysis) are presented. Fall. Ritterhouse.

269 CLINICAL INFORMATICS FOR OUTCOMES MANAGEMENT (3). Prerequisite, HPAA 220. Explores the practical role of clinical informatics skills and tools for health care organizational performance improvement as this role is currently evolving in hospitals, group practices, and provider organizations. Spring. Staff.

270 HEALTH ECONOMICS FOR POLICY AND ADMINISTRATION (3). Prerequisite, BIOS 110, and permission of the instructor for non-HPAA students. Provides training in the theory of health economics and applies this theory to important issues in health policy and administration. Spring. Stearns, Domino.


271 STUDY DESIGN AND REGRESSION ANALYSIS (3). Prerequisites, BIOS 110 or equivalent, and permission of the instructor. The purpose of this course is to familiarize the student with the tools of policy analysis, and to provide hands-on experience in using quantitative policy tools. Spring. Stearns, Biddle, Domino, Norton.

272 METHODS FOR HEALTH POLICY ANALYSIS AND TECHNOLOGY ASSESSMENT (3). Prerequisite, permission of the instructor for nonmajors. Course covers basic methods used to identify policy issues; measure and value health outcomes; identify and estimate health resources; and develop mathematical models to predict outcomes/costs using limited data. Fall. Biddle.

273 LINEAR REGRESSION MODELS (SOCL 209) (3). Prerequisites, HPAA 140 (16) and HPAA 140 (28) or equivalent. This course is an introduction to linear regression models. Topics include: linear algebra, least squares regression, multicollinearity, heteroscedasticity, autocorrelation, and hypothesis testing. Fall. Norton, Domino.

274 ANALYSIS OF CATEGORICAL DATA (SOCL 211) (3). Prerequisite, HPAA 273 or equivalent. This course is an introduction to the analysis of categorical data using maximum likelihood. Topics covered: econometric models in which the dependent variable is not continuous, including Logit, Probit, Tobit, two-part, and duration models. Fall. Norton.
275 ANALYTIC TECHNIQUES IN HEALTH POLICY AND ADMINISTRATION (3). Prerequisites, BIOS 110 and permission of the instructor. Covers a variety of analytic techniques and methodologies basic to more advanced analysis of decision problems in health administration. Fall. Staff.

276 RESEARCH MANAGEMENT AND ETHICS IN HEALTH POLICY (1). A seminar on managing research (managing people, money, time, etc.) and dealing with the full range of ethical issues relevant to conducting research. Spring. Brooks.

277 HEALTH ORGANIZATIONS AND POLICY MAKING (NURS 352) (3). The course offers analytic and practice-focused discussion on how organizations are responding and contributing to policy changes in the current environment; an exercise in real-world strategic decision making is provided. Fall. Millo.

278 GRADUATE HEALTH ECONOMICS SEMINAR (1). Discussion of recent papers in health economics. Students must have solid knowledge of graduate microeconomics theory and econometrics. Fall, spring. Norton.

279 COMPETITION, REGULATION, AND INSURANCE (3). Prerequisites, HPAA 270, HPAA 271, and permission of the instructor for nonmajors. Examines alternative approaches to containing health care costs adopted by public and private payors. Specific topics include: rate regulation of hospitals, competitive bidding, and selective contracting, managed care, and physician payment. Spring. Biddle.

280 LEGAL PROBLEMS IN HEALTH FACILITY ADMINISTRATION (3). Prerequisite, HPAA 281. Readings, cases, and discussion of the legal and ethical aspects of delivery of health care services in the hospital setting. Spring. Gilbert.

281 HEALTH LAW (3). An introduction to law and the legal system as it relates to the delivery and financing of health care. Fall. Harris.

285 ETHICAL ISSUES IN HEALTH POLICY AND POLITICS (3). Prerequisite, HPAA 260, or permission of the instructor. The course considers ethical issues arising in current health policy. Some of the topics considered include abortion, sex education, and the rights and treatment of the seriously defective newborn. Fall. Staff.

290 CANCER PREVENTION AND CONTROL SEMINAR (EPID 290) (HBHE 290) (3). An interdisciplinary overview of cancer prevention and control. Emphasis on projects and activities from perspectives of epidemiology, health behavior, and education, and health policy and administration. Appropriate research design and methodologies are covered. Fall. Kaluzny, O'Malley.

300 DOCTORAL SEMINAR IN HEALTH POLICY AND ADMINISTRATION I (3). Prerequisite, doctoral standing. Readings and discussion of various aspects of health services. Special emphasis is given to the interrelationships of administrative and organizational theory to selected health service topics. Fall. Rozier, Veney, Ricketts, Dow.

301 DOCTORAL SEMINAR IN HEALTH POLICY AND ADMINISTRATION II (3). Prerequisite, HPAA 300. Explores the nature and process of scientific inquiry in the field of health services research by examining the methodological principles and practices of social science as they are applied to health services research. Spring. Ricketts, Veney, Dow, Weiner.

304 SEMINAR IN TEACHING HEALTH POLICY AND ADMINISTRATION (1). Problems and processes of teaching health policy and administration, including supervised practicum experience. Fall and spring. Files.

305 SELECTED TOPICS IN HEALTH POLICY AND ADMINISTRATION: ADVANCED SEMINAR (3). Prerequisite, permission of the instructor. Integrated study of selected topics and research in health services. Separate seminars are developed to correspond to the doctoral student's specific interests and needs. Spring. Rozier, Kaluzny, Veney, Morrissey.

306 SPECIAL PROBLEMS IN HPAA (3). Prerequisites, doctoral standing and permission of the instructor and director of doctoral program. Examination of special problems in health policy and health administration studies. Spring. Staff.

307 SELECTED READINGS IN HPAA (3). Prerequisites, doctoral standing and permission of the instructor and director of doctoral program. Examination of selected readings in health policy and health administration. (On request.) Staff.

308 DIRECTED RESEARCH IN HPAA (3). Prerequisites, doctoral standing and permission of the instructor and director of doctoral program. Examination of directed research topics in health policy and health administration. (On request.) Staff.

311 ADVANCED STUDIES IN POPULATION POLICY AND PROGRAMS (3). Prerequisite, HPAA 211 or equivalent or permission of the instructor. Individualized studies on special problems in population policy analysis and family planning program development. Spring. Staff.

330 DOCTORAL SEMINAR IN ORGANIZATION THEORY AND HEALTH SERVICE ORGANIZATIONS (3). Prerequisites, doctoral standing and HPAA 130 or equivalent, or permission of the instructor. Review and application of selected developments in organization theory to health services research. Fall. Kaluzny.

350 MANAGERIAL TOPICS IN HEALTH CARE FINANCIAL MANAGEMENT (3). Prerequisite, HPAA 250 or permission of the instructor. Course brings together organizational, financial, and marketing concepts. Master's students are required to apply concepts to an actual organization by developing a business/marketing plan. Fall. Zelman.

351 TOPICS IN HEALTH CARE FINANCE (3). Prerequisite, HPAA 250, or permission of the instructor. Analysis of topics of current interest in financial management of health care organizations. May include project selection, endowment stewardship, access to capital. Spring. Staff.

360 POLICY SEMINAR IN HEALTH POLICY AND ADMINISTRATION (1-6). Seminar on policy issues in health policy and administration. Fall and spring. Stearns, Dow, Biddle.

370 STRUCTURAL EQUATION MODELS WITH UNOBSERVED VARIABLES (SOCI 317) (3). Prerequisites, HPAA 273 or SOCI 205, and permission of the instructor. This course is an introduction to general structural equations. LISREL models, classical econometric regression models, and confirmatory factor analysis models are shown to be special cases of the general model. The specification identification, estimation, and assessment of fit of these models are discussed. Spring. Staff.

371 ADVANCED METHODOLOGY IN HEALTH POLICY AND ADMINISTRATION RESEARCH (3). Prerequisites, HPAA 273 and 274, or permission of the instructor. Research methodology as applied to understanding problems in health care delivery. Topics include simultaneous equation models, factor analysis, limited dependent variables, and an introduction to event history analysis. Fall and spring. Stearns, Veney.

372 ADVANCED TOPICS IN HEALTH ECONOMICS I (3). Prerequisite, HPAA 270. This course provides a detailed assessment of current health policy issues from an economics perspective. Potential topics include cost-effectiveness analysis, health insurance, etc. Fall and spring. Stearns.

373 ADVANCED TOPICS IN HEALTH ECONOMICS II (3). Prerequisites, HPAA 270 and 372. This course is a continuation of Advanced Topics in Health Economics I in providing a detailed assessment of current health policy issues from an economics perspective. Fall and spring. Stearns.

390 ADVANCED CONCEPTS AND APPLICATIONS IN HEALTH POLICY AND ADMINISTRATION (3). Corequisite, graduate standing in HPAA and completion of master's core. Integrating and building upon the HPAA master's core, this comprehensive course focuses on organization policy-making and administration from the perspective of the CEO and top management. Spring and summer. Files, Porto, Stearns, Ricketts, Fried, Porter.

391 MASTER'S PAPER DEVELOPMENT (2). Prerequisite, second year MSPH or first year MPH students only. Breadth topics related to the development and management of a research project are covered. The major goal is the development and completion of a proposal to be submitted for independent master's paper.
DEPARTMENT OF MATERNAL AND CHILD HEALTH (MCH)

PIERRE BUEKENS, Chair

Professors
Pierre Buekens (51) Reproductive Health, Minority Health, International Maternal and Child Health
Jonathan Ketch (17) Injury Prevention, Child Abuse and Neglect, Health and Safety in Child Care
Amy O. Tsiu (34) International Family Planning, Reproductive Health, Research Methods
J. Richard Udry (14) Sexual Behavior, Gender Roles, Adolescent Health

Associate Professors
Tuade A. Bennett (48) Women's Health and Maternal Morbidity, Intersection of Race, Class, and Gender in MCH; Reproductive Health and Social Welfare Policy
Dorothy C. Brown (30) Health Policy Analysis, Adolescent Violence and Violence Prevention, Minority Health
Janice M. Dodds (50) Leadership Development in Public Health Nutrition, Childhood Hunger, Community-Based Public Health
Lewis Margolis (43) Child Health Policy, Injury Epidemiology, Community-Based Public Health
Sandra L. Martin (40) Violence, Behavioral and Emotional Health of Children and Families, Substance Use, Prison Health

Clinical Professors
Alan Cross (42) Pediatrics, Adolescent Health, School Health and Infant Mortality Prevention
Anita M. Farel (33) Program and Policy Development for Children with Special Health Care Needs, High Risk Infants, Public Health Practice

Research Associate Professors
Denise Halffman (51) Adolescent Health, Community Prevention Programs, Substance Abuse Prevention, Child and Adolescent Mental Health
Cathy L. Melvin, Reproductive Health, Smoking During Pregnancy, Program and Policy Development

Assistant Professors
Carolyn Halpern (32) Adolescent Health and Development, Sexual Health and Research, Methodology
Anna Maria Segar-Riz (41) Maternal and Child Nutrition, Reproductive Epidemiology, Dietary Trends among Minorities in the United States
Andrea Weathers, Health Care Utilization/Access, Children in Poverty, Ethnic/Cultural Minorities, Immigrant Children

Research Assistant Professors
Shelley Bloom, HIV/AIDS, Reproductive Health, Maternal Mortality and Morbidity, Gender Context of Reproductive Health
Jon M. Hussey, Child Abuse and Neglect, Child and Adolescent Health, Injury Prevention, Population
Kathryn E. (Beth) Moracco, Women's Health, Violence against Women, Program Planning and Evaluation

Adjunct Professors
Jose Belizan, International Maternal and Child Health, Maternal Mortality and Morbidity
Psuru Bhawardwalla (28) Obstetrics and Gynecology; International Women's Health, Maternal and Child Health Gerald L. Breart (63)

Perinatal Epidemiology, Epidemiology of Osteoporosis, Evaluation of Preventive Interventions, Clinical Epidemiology
Judith Fortney (64) Maternal Morbidity and Mortality in Developing Countries
Marcia Herman-Giddens (39) Child Abuse, Child Fatalities, Alternative Healing
Andrew McBride (68) General Pediatrics, Health Promotion and Disease Prevention, Adolescent Health
Thomas Vitagliano (39) Early Childhood Programming, Health Care Financing

Adjunct Associate Professors
Paul A. Buescher (47) MCH Infant Health, Poverty and Health, MCH Program Evaluation
Priscilla Guild (46) MCH and Primary Care Health Services Planning and Evaluation
Lynn Knauff (38) International Family Planning and Maternal Health, Training of FP/MCH Health Personnel, MCH/FP Program Development and Evaluation
Marie Meglen (42) Maternal and Child Health Service Delivery System, Nurse Midwifery
Robert Meyer (62) Reproductive and Perinatal Epidemiology, Birth Defects Surveillance, Program Evaluations
Merry K. Moos (54) Prenatal Care, Women's Preventive Health, Fertility Decision Making
Mary Pellegrino, MCH, Data Management and Utilization, Program Planning, Monitoring, and Evaluation
Kevin J. Ryan (37) Statewide Delivery of Women's Health Services, Prenatal Health, Health Care Ethics
Jane Stein (56) Women's Health in Developing Countries, Social Determinants of Health, Evaluation

Adjunct Assistant Professors
Patsy Bailey, International Maternal and Child Health
Joseph DeGraff-Johnston, International Reproductive Health
Caroline Whitehead Doherty (60) Primary Farmworkers' Health, Hispanic Health, Reproductive Health
Alfredo Porte, International Reproductive Health in Latin America, Program Research and Evaluation
Elaine Hart-Booth (61) Women's Health, Cardiovascular Epidemiology, Education and Prevention
Jack Leis, MCH Research
Kathrin Maiy, International Reproductive and Child Health
Roland E. Miliangk (70) Obstetrics and Gynecology
Denise Nadeau, Family Planning, Reproductive Health
Jo Shackelford, Children with Special Needs, Special Education Legislation
Susan Spall (52) School Health, Adolescent Substance Abuse, HIV

Lecturers
Ruth Petersen (55) Violence in Pregnancy, Unintended Pregnancies, Adolescent Health
Jacqueline Resnick, Research Training, Proposal Development

Professors Emeriti
Jaroslav Fabian Hulka
Howard Jacobson
C. Arden Miller
Earl Schaefer
Elizabeth Watkins

Associate Professors Emeriti
Geraldine Gourley
Barbara Stocking

Courses
103 REPRODUCTIVE PHYSIOLOGY AND CONCEPTION CONTROL (1).
An interactive web-based course on reproductive physiology, contraception, and sexually transmitted diseases for students without prior health professions training. Fall. Buekens.
110 DEMOGRAPHY OF WOMEN AND CHILDREN IN DEVELOPING COUNTRIES (3). Permission required for all nonmajors. Introduction to basic population concepts and measures, emphasizing demographic indicators of health and social status of women and children in developing countries. Spring. (Alternate years.) Tsui.

111 NUTRITION OF CHILDREN AND MOTHERS (NUTR 111) (3). Prerequisite, NUTR 100 or equivalent. Biological bases for nutrient requirements and dietary recommendations as they vary throughout the life cycle. Covers the nutritional needs of women during childbearing years, infants, children, and adolescents. Fall. Adair.

125 INJURY AS A PUBLIC HEALTH PROBLEM (EPID 125) (HBHE 125) (3). Prerequisite or corequisite, EPID 160. This course considers the causes and consequences of traumatic injury within developmental, social, and economic contexts, including dilemmas in injury prevention. Injuries associated with transportation, violence, and the home and occupational environments are included. Three lectures per week. Fall. Runyan, Kotch.

140, 141, 142 PROBLEMS IN MATERNAL AND CHILD HEALTH (1-3). Prerequisites to be arranged with the faculty in each individual case. Two to six hours a week. Fall, spring, and summer. Staff.

200 ISSUES IN MATERNAL AND CHILD HEALTH (3). Prerequisite, permission of instructor. For students outside the department of MCH who desire a survey of current issues and programs in maternal and child health. Three lecture hours per week. Spring. Margolis.

205 INTERNATIONAL FAMILY PLANNING (3). Permission required. Prerequisite, graduate study in MCH. Analysis of the family planning movement, its policies, operations, and research, with emphasis on developing countries. Three lecture hours a week. Spring. Tsui.

206 PERINATAL HEALTH SERVICES (3). Evaluation of local, state, and national interventions to improve perinatal health. Topics include effectiveness of prenatal care, regionalization, risk assessment, racial disparities, linkages with Medicaid, etc. Three seminar hours. Fall. Staff.

208 CONCURRENT FIELD TRAINING IN MATERNAL AND CHILD HEALTH (1-4). Prerequisite, MCH 214. An elective, faculty-supervised field experience in maternal and child health research, community practice, program planning, and evaluation. Students are supervised on-site by department-appointed field instructor. Students choosing this elective are not exempt from MCH 214. Variable number of hours. Fall, spring, and summer. Staff.

209 MATERNAL AND CHILD HEALTH POLICY AND PROGRAM DEVELOPMENT (3). Prerequisite, MCH major. This course reviews the historical development of MCH policy and programs and examines principal governmental and nongovernmental actors in the MCH policy and program development process, exploring how they influence policy. Three lecture hours per week. Fall. Margolis.

210 MATERNAL AND INFANT HEALTH (3). Permission required for non-MCH majors. Knowledge base, social strategies, and health policies that relate to the health and well being of women of childbearing years, neonates, and families. Three lecture hours per week. Fall. Bennett.

211 CHILD AND FAMILY HEALTH (3). Permission required for non-MCH majors. This course addresses major issues in child and adolescent health including interactions among children, their families, and environment. Consideration is given to models of intervention with emphasis on the preventive health approach. Three lecture hours per week. Spring. Ketch.

211L CHILD AND FAMILY HEALTH LAB (1). Corequisite, MCH 211. Permission required for non-MCH majors. Required small-group presentations and in-depth discussion of topics covered in lecture. Students choose two consecutive groups depending upon availability of leaders. Two lab hours per week. Spring. Staff.

213 RESEARCH METHODS IN MATERNAL AND CHILD HEALTH (3). Permission required for non-MCH majors only. The art and science of MCH research, with an emphasis on applied survey research. Student groups will design and carry out a small survey, and present their findings in a poster presentation. Focuses on assessment of MCH population characteristics, secondary data analysis, and the evaluation of MCH programs. A practicum-based course. Three lecture hours per week. Fall. Buikens, Hussey.

213L RESEARCH AND EVALUATION METHODS IN MATERNAL AND CHILD HEALTH LAB (1). Corequisite, MCH 213. Permission required for nonmajors. The MCH 213 Lab, which is a companion course to MCH 213, introduces students to statistical analysis using SAS-PC and microcomputers. Two lab hours per week. Fall. Staff.

214 FIELD TRAINING IN MATERNAL AND CHILD HEALTH (2-8). A faculty-supervised field experience in maternal and child health research, community practice, program planning, and evaluation. Students are supervised on-site by department-appointed field instructor. An additional field fee of $350 is assessed. Fall, spring, and summer. Minimum of six weeks. Staff.

219 PERINATAL EPIDEMIOLOGY (EPID 219) (3). Prerequisites, EPID 160, BIOS 110, or equivalents. Epidemiology of major reproductive health outcomes, including infertility, fetal loss, birth weight, congenital malformations, infant mortality. Current knowledge regarding epidemiology of these outcomes; discussion of methodologic issues specific to reproduction. Fall. O'hanian, McMahon.

220 SERVICES FOR CHILDREN WITH CHRONIC CONDITIONS (3). Permission of the instructor. This course focuses on the design, organization, and delivery of services for children with special health care needs and their families, and examines current program development and public policies. Participants analyze the range of services needed by these children. Fall. Farel.

222 ISSUES IN INTERNATIONAL MATERNAL AND CHILD HEALTH (3). Permission required for nonmajors. The course focuses on key issues concerning the health status and needs of mothers and children, primarily but not exclusively in the developing world. Topics include primary health care, measurement and indicators of health status, levels and patterns of maternal and child morbidity and mortality, major programmatic intervention, oral rehydration therapy, and national policy orientations towards the health needs of these two groups. Three lecture hours per week. Fall. Boerma.

226 ADOLESCENT HEALTH (3). Topics covered include the epidemiology of health problems, developmental issues, health services, and psychosocial influences on adolescent problem behaviors. Course materials are useful for research generation and practical application. Three seminar hours per week. Spring. Halpern.

227 WOMEN'S HEALTH: A LIFE CYCLE PERSPECTIVE (2). Permission required for nonmajors. This course provides a survey of the sources and causes of morbidity and mortality among women from birth to extreme old age. A goal is to highlight subject areas historically under-researched or underserved. Two lecture hours a week. Fall or spring. Staff.

230 REPRODUCTIVE HEALTH POLICY (3). Permission of the instructor required. This seminar examines the role of social policy relating to reproduction and the differential impact of policy based on socioeconomic status, race, ethnicity, and other factors. Focus is on current controversies in reproduction and reproductive health services in the United States. Three lecture hours a week. Spring. Bennett.

231 RACE, ETHNICITY, AND PUBLIC HEALTH RESEARCH: ISSUES AND METHODS (2). Permission of the instructor required. This course addresses theoretical and practical issues related to the collection, analysis, and interpretation of racial and ethnic data. The course explores innovative research strategies and methodologies relevant to the health of minority populations. Specific topics include and ethnic classification, survey sampling, small area analysis, measuring racial disparities in health status, racism as a risk factor, and distinguishing between race/ethnicity and social class. Spring. Browne.
246 MATERNAL AND CHILD HEALTH PROGRAM PLANNING AND EVALUATION (3). Permission required for non-majors in SPH Students will develop research skills related to: needs assessment, conceptualization of MCH problems, selection of effective program setting measurable objectives, implementation and evaluation. Final project will be a proposal for funding an MCH program. Spring, Morocco.

252 ETHNICITY AND HEALTH IN A GLOBAL CONTEXT (2). Prerequisite, permission of instructor. This course will cover topics in ethnicity and health, including discussion and readings from and about both developed and underdeveloped countries. Students will be responsible for leading at least one class. Spring, Stein, Knauff.

253 VIOLENCE AGAINST WOMEN (3). Permission required for non-MCH majors. Violence against women is examined as a public health problem. Areas investigated include definitional issues, prevalence of the problem, risk factors and outcomes, and community and medical interventions. Spring, Martin.

259 THEORETICAL PERSPECTIVES ON MATERNAL AND CHILD HEALTH (3). Prerequisites, doctoral students, permission of instructor. A survey of theoretical models used in MCH research and program development and how those models are used to guide the formulation of questions, hypothesis testing, and evaluation. Fall, Halpern.

260 CONCEPTUALIZATION, DESIGN, AND MEASUREMENT (3). Permission required for non-majors and master's students. Prerequisite, MCH 259. The course follows the research process from the formulation of a research question and the design of a research methodology to addressing the question through the design of an appropriate analysis strategy. Three lecture hours a week. Spring, Martin.

261 THEORY AND METHODS RELATED TO MCH DATA ANALYSIS (3). Permission required for non-majors and master's students. Prerequisite, MCH 213, EPID 160, and BIOS 110 or equivalents. Topics such as sampling, effect modification, sampling design effects, significance testing, and multivariate analysis will be discussed in greater detail with direct applications to data analysis. Fall, Siega-Riz.

262 MCH PROGRAM EVALUATION (3). Permission required for non-majors and master's students. Prerequisite, knowledge of SAS, MCH 213, or equivalent. Analytic skills seminar focusing on the theory and practice of MCH program evaluation. Through examples of MCH program evaluations and a student class project, students are exposed to all phases and issues surrounding MCH program evaluation (including conceptualization, negotiations, management operations, analytic strategies implementation, presentation, etc.). Three lecture hours a week. Spring, Hallford.

300 DOCTORAL SEMINAR IN MATERNAL AND CHILD HEALTH (2). Permission required for non-majors and master's students. This seminar explores the major MCH policies and philosophical controversies and dilemmas that provide the paradigm for maternal and child health policy development. Two lecture hours a week. Fall, Staff.

301 DOCTORAL SEMINAR IN MATERNAL AND CHILD HEALTH (2). Permission required for non-majors and master's students. Prerequisite, MCH 300. This seminar explores the origins and developments in major maternal and child health policies and programs in order to understand their effects on the health of mothers and children. Two lecture hours a week. Spring, Margolis.

302 DOCTORAL RESEARCH SKILLS COLLOQUIUM (1). Permission required for non-majors and master's students. Prerequisite, enrollment in the MCH doctoral program. The seminar is the first semester of a two-year research skills colloquium for all new doctoral students. The course addresses research, problem definition, proposal design, and development. Two-hour seminar a week. Fall, spring, Buekers.

315 PROGRAM ASSESSMENT IN MCH (3). Nonmajors require permission of the instructor. Offers an opportunity for students to explore in greater depth a selected MCH practice topic. Students will learn how to provide consultation about a selected program activity. Spring, Fazel.

340 MCH DOCTORAL INTERNSHIP (1). Prerequisite, enrollment in MCH doctoral program. MCH internship to enhance doctoral training in areas of Section 1: Teaching, Section 2: Practice, and Section 3: Research. Fall, spring, summer, Staff.

392 MASTER'S PAPER (Hours vary). Fall, spring, and summer.

393 MASTER'S THESIS (Hours vary). Fall and spring.

394 DOCTORAL DISSERTATION (Hours vary). Fall, spring, and summer.

DEPARTMENT OF NUTRITION (NURT)

STEVEN H. ZEISEL, Chair

Professors
John J. B. Anderson (2) Calcium, Isoflavones, Other Nutrients and Bone Indices in Women, Diet, Physical Activity, and Body Composition, Diet and Aging

Lenore Arab (52) Dietary Assessment Methodologies, Nutrition and Cardiovascular Disease Epidemiology, Antioxidants and Cancer Epidemiology

Stephen G. Chaney (43) Mechanism of Action of Platinum Anticancer Agents, DNA Repair, HPLC Methodology

Rosalind A. Coleman (39) Diabetes: Lipid and Carbohydrate Metabolism; Obesity: Partitioning of Energy between Triacylglycerol Storage and Fatty Acid Oxidation; Regulation of Triacylglycerol Synthesis; Glycogen Storage Disease

Anthony C. Hackney (50) Endocrine and Metabolic Responses to Physical Stress, Physiology of Exercise

William D. Heizer (46) Gastrointestinal Absorption, Malabsorption Syndromes, Consequences of Long-Term Parenteral Nutrition in Hospitalized Patients, Digestive Diseases Causing Malnutrition

Mark Koruda, Surgery, Parenteral and External Nutrition

Kay Lund (69) Insulin-Like Growth Factors, Intestinal Development, Nutrient and Cytokine Interactions in Intestinal Inflammation, Injury and Repair

Nobuya Maeda (77) Animal Models of Hyperlipidemia, Atherosclerosis, and Cardiomyopathy

Robert G. McMurray (51) Exercise Physiology, Energy Expenditure of Activity, Cardiovascular Disease Risk Factors and Obesity in Youth, Multiple Metabolic Syndrome, Sports Nutrition

Barry M. Popkin (17) The Nutrition Transition: Patterns and Determinants of Dietary Trends and Body Composition Trends (United States and Low Income Countries); Obesity Dynamics and Their Environment Causes; Dietary and Physical Activity Patterns, Trends, and Determinants; the Creation of Large-Scale Program and Policy Initiatives to Address Nutrition-Related Noncommunicable Diseases

Marc Rholes, Pediatric Gastrointestinal Disease and Nutrition, Especially Infant Diarrhea; Mechanisms of and Signaling during Intestinal Repair

June Stevens (56) Epidemiologic Studies of Obesity, Intervention Trials, Physical Activity, Minority Health

James Swenberg, Chemical Carcinogenesis and Toxicology, DNA Damage and Repair, Oxidative Stress, Biomarkers, and Mass Spectrometry

Louis E. Underwood (45) Insulin-Like Growth Factors and Their Effects in Obesity, Fetal Growth, and Dietary Restriction

Dianne Ward, School- and Community-Based Interventions to Promote Physical Activity in Children and Adolescents; Obesity Prevention and Early Intervention in Youth; Measurement of Physical Activity

Steven H. Zeisel (38) Nutrients and Brain Development, Choline and Carcinogenesis, Choline Metabolism and Requirements in the Human, Isoflavones and Cancer, Antioxidants and Apoptosis, Computer-Assisted Instruction

Research Professors
Martin Kohlmeier (53) Biomarkers in Nutritional Epidemiology, Lipid Metabolism, Vitamin K Transport and Function

Rudolf Salganik, Oxidative Stress, Apoptosis, and Cancer
Clinical Professor
John B. Longenecker (44) Nutrition, Exercise and Weight Control, Nutrition and Cancer, Nutrition and Medicinal Herbs, Dietary Amino Acid Intake, Effects of Long-Term Nutrition on Aging

Adjunct Professors
Dan Carroll, Chemistry and Processing of Plant Products
John A. Gdowski
Hugh Tucker
Steven A. Kliewer, Regulation of Lipid and Xenobiotic Metabolism by Nuclear Receptors
Bernadette Marrriott
Guy Miller, Energy Metabolism and Metabolic Control, Therapeutics; Entrepreneurship
Mildred Seelig, Magnesium Metabolism, With Emphasis on Its Requirements and How They Are Influenced by Other Nutrients
Richard C. Theuer, Infant Foods and Nutrition

Associate Professors
Alice S. Ammerman (41) Design and Evaluation of Nutrition and Physical Activity Interventions for Chronic Disease Risk Reduction (Obesity, Cancer, Heart Disease, Diabetes) in Lower Income and Minority Youth and Adults, Patterns of Diet-Related Practice in Primary Care
Melinda Beck (70) Relationship between Antioxidant Nutrition and Infectious Disease
Margaret Bentley (67) Nutritional Anthropology, Sociocultural Determinants of Infant and Child Feeding, Breastfeeding and Reproductive Health
Marc K. Campbell (57) Nutritional and Health Behavior Change Interventions, Cancer Prevention and Control, Health Communication, Minority Health
Janice M. Dodds (26) Nutrition Policy, Leadership Development in Public Health Nutrition, Community-Based Program Implementation
Pamela S. Haines (32) Dietary Trends, Patterns, and Determinants, Diet Quality Assessment, Aging and Women’s Health, Nutrition and Public Health Policy, Nutrition Epidemiology
Boyd R. Switzer (5) Carotenoids, Lignans, Vitamin A and E and Cancer, Nutritional Biomarkers and Dietary Fiber

Research Associate Professor
Craig D. Albright (54) Dietary Antioxidants, Apoptosis Signaling and Tumorigenesis
Barbara H. Dennis (40) Cardiovascular Nutritional Epidemiology, Dietary Assessment, Cultural Determinants of Food Habits

Adjunct Associate Professors
Katherine M. Flagel, Epidemiology of Obesity and Related Conditions; Dietary Assessment Methods; Misclassification and Measurement Error
Jeffrey M. Gimbble, Stem Cell Differentiation, Adipogenesis, Chondrogenesis, Osteogenesis, Adult Stem Cells, Hematopoiesis

Assistant Professors
Joyce Harp (60) Obesity and Adipocyte Growth
William Notte (73) Food Service Management
Yashomati Patel (74) Adipocyte Proliferation and Differentiation
Anita Maria Segovia-Ruiz (62) Maternal Nutrition and Birth Outcomes, Adolescent Dietary Habits, Minority Dietary Trends, Reproductive Epidemiology

Research Assistant Professors
Kerry da Costa (58) Choline, Folate, and Metabolism
Patricia Gallagher, Fatty Acid Metabolism, Cancer Epidemiology and Nutrient Biomarkers, Fatty Acids and Carcinogenesis, Conjugated Linoleic Acid (CLA) and Prostate Cancer
Penny Gordon-Larsen (73) Obesity Epidemiology, Physical Activity, Environmental and Sociodemographic Determinants of Physical Activity, Minority Health, Adolescent Nutrition and Health
Kristine Kelsey (71) Health Promotion and Disease Prevention, Prevention of Childhood Obesity, Health Behavior Change, Women’s Health
Susan Steck Scott, Cancer Epidemiology, Carotenoids, DNA Damage and Repair, Gene-Nutrient Interactions, Nutrient Biomarkers
Miroslav Styblo (72) Metabolic Interactions of Essential Micronutrients, Especially Trace Metals, with Toxic Metals and Metallodrugs that Contaminate Food Chain and Drinking Water Reservoirs
Namvar Zohoori (60) Nutrition Epidemiology, Nutrition and Aging, Population and International Nutrition

Clinical Assistant Professors
Chuck Lee, Educational Technology
Claudia Plaisted (65) Eating Disorders, Disordered Eating and Obesity, Distance Education

Adjunct Assistant Professors
Marjorie Busby, Human Clinical Nutrition
Annette Cowan, Nutrition Intervention
Rebecca Freeman, Children with Special Needs
Sanford Garner, Regulation of Parathyroid Hormone (PTH) Secretion in Animal Models and in Human Primary and Secondary Hyperparathyroidism
Bethany Jackson (75) Pharmacology and Nutrition, Dietary Changes in Minority Populations
Frank Kar, Nutrients and Environmental Health
Jarl Knowles, Clinical and Behavioral Treatment of Obesity, Depression and Obesity, Gastrointestinal Motility Disorders, Gastrointestinal Absorption
Gwen Murphy, Type 1 and Type 2 Diabetes in Children, Teens, and Young Adults, Insulin Resistance in Children and Teens, Childhood and Teen Obesity
Miriam Peterson, Public Health Nutrition

Clinical Instructor
Karen Lindell, Nutrition Education in Medicine, Nutrition Research and Clinical Trials

Research Instructors
Bobbette Jones (76) Women’s Health Issues, Diet and Disease
Barbara Laroira, Influence of Food Security on Health Outcomes within Vulnerable Populations, Maternal Nutrition and Birth Outcomes, Nutrition Policy

Professors Emeriti
Joseph C. Edozie
Nidjat Kaufman
Rebecca B. Bryan
Mary Ann C. Fanthig

Courses
100 INTRODUCTION TO MEDICAL NUTRITION (3). Prerequisites, NUTR 40, CHEM 11, 21, and BIOL 11. Function of the human body focusing on nutrient interaction. Review of structure and function of cells and organs. For advanced undergraduates and graduate students needing to enhance background prior to NUTR 110. Spring, Switzer.

110 NUTRITIONAL BIOCHEMISTRY AND NORMAL CELL FUNCTION (3). Prerequisites, NUTR 100, CHEM 11, 21, and BIOL 11 or equivalent. Covers normal cell biochemistry and physiology, emphasizing roles of nutrients throughout the life cycle; chemistry and metabolism of proteins, fatty acids, carbohydrates and lipids; endocrine/paracrine regulation of metabolism. Fall, Patel.

111 NUTRITION OF MOTHERS, INFANTS, AND CHILDREN (3). Prerequisites, NUTR 100 or equivalent, to be taken in parallel with NUTR 110. Biologic bases for nutrient requirements and dietary recommendations as they vary throughout the life cycle. Covers the nutritional needs of women during childbearing years, infants, children, and adolescents. Fall. Adair and Gordon-Larsen.
112 NUTRITION IN THE ELDERLY. Prerequisites, NUTR 100 or equivalent. Special dietary and nutritional needs and conditions of the elderly. Includes overview of biology and demography of aging, discussion of nutritional requirements, and assessment of the elderly as well as nutrition in health and various disease states of the elderly. Fall, Zehoori.

120 NUTRITIONAL BIOCHEMISTRY AND DISEASE PROCESSES. Prerequisite, NUTR 110. Covers biochemistry and pathophysiology of diseases with emphasis on roles of nutrients in prevention causation, and/or therapy. Materials from prerequisite used as basis for study of molecular mechanisms responsible for disease processes. Spring, Anderson.

121 MEDICAL NUTRITION THERAPY. Prerequisite, NUTR 120. Course designed to examine the rationale and implementation of diet therapy and nutrition support in the prevention or treatment of disease. Spring, Barrett.

132 NUTRITION ASSESSMENT AND COUNSELING SKILLS. Prerequisite, NUTR 40 or equivalent. Functions of a nutritionist working with individuals, emphasizing interviewing, assessment, nutrition care planning, counseling, and service documentation in prevention and therapeutic situations. Practice in the use of current dietary analysis software programs and development of educational materials included. Fall, Barrett.

140 FOOD SCIENCE AND MEAL PREPARATION. Prerequisite, NUTR 100. Introduction to foods important in the American diet; composition and properties; factors affecting the selection, handling, and preparation of foods; menu planning and meal preparation. Laboratory fee $30. One lecture hour and two laboratory hours per week. Fall, Barrett.

141 FOOD SERVICE SYSTEMS MANAGEMENT. Permission of the instructor required for non-majors. Basic concepts of institutional food service systems management applied to small and medium-sized health care facilities in the community. Two lecture hours and two laboratory hours per week. Fall, spring, Carroll.

142 FOOD PRODUCTION, PROCESSING, AND PACKAGING. Prerequisite, NUTR 100 or equivalent. Impact of all parts of food industry on availability and nutritive value of foods, and food safety. Spring, Carroll.

150 NUTRITION POLICY AND PROGRAMS. A survey of the history of nutrition, health and food programs. Spring, Haines.

170 READINGS IN NUTRITION. Prerequisite, permission of the instructor. Reading and tutorial guidance in special areas of nutrition. Fall, spring, summer, faculty.

190 NUTRITION RESEARCH. Prerequisite, permission of the instructor. Individual arrangements with faculty for bachelor and masters students to participate in ongoing research. Fall, spring, summer, faculty.

210 NUTRITION ASSESSMENT. Prerequisite, NUTR 100 or permission of the instructor. This course is taught as three independent one-credit modules. Dietary Assessment (theory and rationale of nutritional assessment in individuals and populations; one credit). Anthropometric Assessment (one credit). Clinical Laboratory Assessment (one credit). Spring, Switzer.

220 CLINICAL NUTRITION EXPERIENCE. Prerequisites, NUTR 110, 121, 132. Students are assigned to medical facilities where, under supervision of registered dietitians, they participate in the nutritional care of patients. Field fee of $450. Forty hours per week for one week. Summer, Barrett and field preceptors.

230 DIETARY CHANGE INTERVENTIONS. Prerequisite, NUTR 150. Focus on developing theory-based nutrition interventions at the population level. Addresses levels of interventions such as schools and workplace sites; methods of implementation including social marketing and mass media, curriculum analysis and principles of assessing change. Spring, Campbell.

250 PUBLIC HEALTH NUTRITION MANAGEMENT I. Prerequisite, NUTR 150. Addresses roles and functions of the health care team and nutritionist in providing nutrition services at the community level. Includes community assessment and organization, quality assurance and program evaluation, and basic personnel management. Three lecture hours and one-day concurrent field experience per week. Fall, Ammerman.

251 PUBLIC HEALTH NUTRITION MANAGEMENT II. Prerequisite, NUTR 250. An overview of the planning and management of local, state, federal, and voluntary public health nutrition programs. Examines legislative and administrative structures. Includes grant writing for program development. Three lecture hours and one-day concurrent field experience per week. Spring, Dodds.

252 PUBLIC HEALTH FIELD EXPERIENCE. Prerequisite, NUTR 251. During a consecutive eight-week block of time, students are assigned to a state, local, or district health agency or other appropriate agency for supervised field experience. Field fee of $450. Fall, spring, summer, Dodds, Switzer.

253 NATIONAL NUTRITION ISSUES. Prerequisite, NUTR 251 or permission of the instructor. Three-day in-depth seminar held in Washington, D.C., on national nutrition issues, policy formulation, and program development with key congressional staff, federal agencies' staff, and pertinent public interest/consumer advocacy groups. Paper required. Field fee $50. Spring, Dodds.

259 NUTRITIONAL EPIDEMIOLOGY. Prerequisites, EPID 160 or 168 and BIOS 101 or 110 or equivalents. This course builds the foundation for critical evaluation of the nutritional epidemiologic literature. Spring, Alternate instructors by years: Arbo (odd years), Stevens (even years).

261 INTERNATIONAL NUTRITION. Provides a broad overview of international nutrition research issues, programs, and policies. Topics will include micronutrient deficiencies, child feeding and growth, determinants of under- and over-nutrition, chronic disease and nutrition, food fortification and supplementation, and nutrition intervention programs and policy. Fall, Adair, Bentley, and Popkin.

262 INTERNATIONAL NUTRITION: SPECIAL TOPICS. Prerequisite, NUTR 261. Follow-up in greater detail of selected issues discussed in NUTR 261. Two seminar hours per week. Spring, Adair.

270 NUTRITION RESEARCH METHODS. Prerequisites or corequisites, BIOS 101 or 110 and EPID 160 or 168. In a journal club format using current peer-reviewed literature, critical-thinking skills are applied to methodological issues related to measurement, design, and analysis of basic, clinical, and population-based nutrition studies. Fall, Jones.

305 NUTRITIONAL METABOLISM. Prerequisite, NUTR 110 or equivalent. A problem-based approach to examine nutrient metabolism in humans, focusing on normal physiology and biochemical processes. Students interpret data and design experiments related to nutrient metabolism study. Fall, spring, Coleman and nutrition biochemistry faculty.

310 ADVANCED NUTRITIONAL BIOCHEMISTRY: SIGNAL TRANSDUCTION. Prerequisites, NUTR 110 and 120 or equivalent. Includes interactions of nutrients/growth factors/hormones/second messengers with metabolism, growth and differentiation of oncogene. Fall. Alternating with 311 and 322. Faculty.

311 ADVANCED NUTRITIONAL BIOCHEMISTRY, NUTRITIONAL GENETICS. Prerequisites, NUTR 110 and 120, or equivalent. Integration of human nutrient metabolism with an appreciation for the impact of genetic variation in health and disease. Practical application of genetics in nutrition research, public policy and nutrition practice. Fall. Alternating with 310 and 322. Köhlmeyer.

315 BIOCHEMISTRY OF NUTRITION-RELATED DISEASES. Prerequisite, NUTR 110 or equivalent. Seminar and problem-based approach to the biochemistry of nutrition-related diseases including obesity, diabetes, atherosclerosis, cancer, and osteoporosis. Spring, Coleman.
320 NUTRIENTS AND DISEASE: MINERALS (2). Prerequisite, NUTR 120. A seminar reviewing the nutrition and metabolism of the major minerals, with a focus on calcium and phosphorus. Spring. Alternating with 321, 323. Anderson.

321 NUTRIENTS AND DISEASE: CARCINOGENESIS (2). Prerequisites, NUTR 110 and 120 or equivalent. Nutrient interactions with the process of carcinogenesis. Effects of cancer on the metabolism of nutrients. Spring. Alternating with 320, 323. Faculty.

322 NUTRIENTS AND DISEASE: CARDIOVASCULAR DISEASE (2). Prerequisites, NUTR 110 and 120 or equivalent. Presents an understanding of molecular and physiological events preceding cardiovascular diseases and the role of nutrition in the prevention of modification of risk and treatment. Fall. Alternating with 310, 311. Ziesel.


325 ADVANCES IN CARBOHYDRATE AND LIPID METABOLISM (1). Prerequisites, MEDI 120, NUTR 110, or equivalent. Seminar discussions of recent papers related to carbohydrate and lipid metabolism, including fatty acid regulation of gene expression, glucose transporters, and genetic defects causing diabetes, and fatty acids in neural development. Spring. Coleman.

350 ADVANCED NUTRITION INTERVENTION AND POLICY (3). Permission of the instructor. Students will explore the impact of micro and macro level nutrition policies and will develop expertise in theory-based intervention design and evaluation at the individual and organizational levels, including study design and measurement. Spring. Ammerman, Haines.

351 ADVANCED PUBLIC HEALTH NUTRITION MANAGEMENT (3). Prerequisite, MPH degree or permission of the instructor. Analysis of policy development and management techniques used in the public and private sectors with relevance to development and management of nutrition policy and programs. Spring. Alternating years. Dodds.

354 QUALITATIVE EVALUATION AND RESEARCH METHODS (3). Prerequisites, HHBE 250 or equivalent. Theoretical and methodological approaches of applied medical anthropology for health program development and evaluation. Field methods for collecting and analyzing data through observation, interviewing, group methods, and case studies. Fall, spring, Bentley, Steckler.

360 ANALYTICAL METHODS IN NUTRITIONAL EPIDEMIOLOGY (3). Prerequisites, EPID 160 or 168, NUTR 259, and BIOS 145 or permission of instructor. This course teaches the skills and techniques required to study dietary exposures, anthropometric status, and disease outcomes. Students gain skills in analysis and interpretation of anthropometric data. Concepts and applications include quantification and measurement of dietary intake, use and management of monitoring nutritional data sets, application and interpretation of epidemiologic and statistical methods for the analysis of these data (such as linear and logistic regression and hazard modeling), and appropriate use and interpretation of anthropometric indices. Fall. Alternating years. Szig-Aizik and Adair.

361 OBESITY EPIDEMIOLOGY (3). Prerequisites, EPID 160 or 168 and BIOS 110. Examines epidemiology research on the causes, consequences, and prevention of obesity. Emphasis on methodologic issues pertinent to obesity research. Spring. Alternating years. Stevens.

362 DIET AND CANCER (3). Prerequisite, EPID 160 or 168 and BIOS 110. Examines epidemiologic research on food-related exposures and prevention of cancer of various sites. Emphasis on skills for conducting and analyzing epidemiologic studies on gene-nutrient interactions in carcinogenesis. Spring. Alternating years. Arab.

371 ELEMENTS OF BEING A SCIENTIST (3). Prerequisite: doctoral students ready to formulate dissertation focus. Focuses on key elements that contribute to a successful career as a scientific researcher. These include: scientific presentations, scientific photography and graphics, writing a scientific manuscript, and evaluating published manuscripts; grant writing and sources of funding; peer review; use of animals and humans in research; scientific ethics. Fall. Ziegel, Popkin, Bentley.

373 DOCTORAL SEMINAR (1). This course is designed for doctoral and master of science students only. Critical review of current literature in nutritional biochemistry, intervention and policy, and population-based nutrition science. Focuses on the development of skills in reviewing and critiquing journal articles. Fall, spring. Ward.

374 RESEARCH ROTATIONS FOR NUTRITIONAL BIOCHEMISTRY DOCTORAL STUDENTS (1-3). Three laboratory or research group rotations supervised by Nutritional Biochemistry faculty. Provides a breadth of research experience for students prior to selecting dissertation adviser. Up to six laboratory hours per week. Fall, spring, summer. Faculty.

375 NUTRITION RESEARCH (1-9). Individual arrangements with faculty for doctoral students to participate in ongoing research. Fall, spring, summer. Faculty.

392 MASTER'S PAPER (3-6). Fall, spring, summer. Faculty.

393 MASTER'S THESIS (3-9). Fall, spring, summer. Faculty.

394 DOCTORAL DISSERTATION (3-9). Fall, spring, summer. Faculty.

PUBLIC HEALTH LEADERSHIP PROGRAM (PUBH)

WILLIAM A. SOLLECITO, Director

Saundra S. Shay, Leadership and Public Health Nursing Director (Residential and Distance)

Vauhn M. Upshaw, Dr.PH. -- Leadership Director

Linda S. Kinsinger, Health Care and Prevention Director

Bonnie Rogers, Occupational Health Nursing Director (Residential and Distance)

Professors

Jean Goepfert (62) Health Promotion and Leadership

Arnold D. Kallay (60) Public Health Leadership, Organizational Design and Behavior, Program Implementation and Evaluation

James E. Veney (74) Public Health Leadership, International Health Research and Evaluation Methodology, Statistical Applications

Associate Professors

Eugenia Eng (75) Public Health Practice, Cross-Cultural Health Education, Program Strategies and Design

Thomas C. Ricketts (72) Public Health Leadership, Rural Health Care, Policy Implementation and Development

Bonnie Rogers (16) Occupational Health Nursing, Public Health Nursing

Assistant Professor

Timothy S. Carey (69) Health Care and Prevention

Research Professor

William A. Sollecito (78) Continuous Quality Improvement, Program Management, Distance Learning

Clinical Professors

Thomas J. Bacon (76) Area Health Education Centers and Public Health Leadership

Carmen H. Buell (77) Health Care Legislation

Rachel H. Stevens (15) Public Health Practice and Public Health Nursing

Clinical Associate Professor

Richard M. House (70) Distance Learning, Continuing Education, Health Behavior and Health Education

Clinical Assistant Professors

Paul K. Halverson (67) Public Health Leadership, Health Administration

Lorraine B. Johnson (22) Chronic Illness and Health Promotion
School of Public Health: Public Health Leadership Program

Saundra S. Shay (21) Mental Health, Education, and Leadership
Vaughn M. Upshaw (80) Public Health Leadership, Governance, Organizational Behavior
Julie J. C. Vann (81) Distance Learning, Managed Care, Health Finance

Research Associate Professor
Joanne M. Garrett (82) Health Care and Prevention

Research Assistant Professor
Shulamit L. Bernard (88) Health Administration Research, Aging, Health Policy

Lecturer
Elizabeth M. Tornquist (18) Research Methodology, Scientific Writing

Clinical Instructor
Judith S. Ostendorf (57) Occupational Health Nursing

Research Instructor
Christina A. Harlan (45) Migrant Health

Adjunct Professors
Jan R. Atwood (23) Cancer Prevention and Aging, Health Promotion, Research Instrument Development and Methodology
Klaus O. Schäfer

Adjunct Associate Professor
William L. Atkinson (86) Health Care and Prevention

Adjunct Assistants
Larry Branch, Aging and Human Development
Vic Cocowitch, Group Dynamics and Organizational Effectiveness
Margaret E. Molloy (84) Managed Care, Community Assessment, Partnerships
Constance F. Mullinix (54) Public Health Policy
Patricia O'Leary Cunningham (85) Public Health Nursing Administration, Community Health Nursing
William J. Woodward, Management, Organizational Development, Psychotherapy

Adjunct Clinical Professors
John M. Booker, Community Assessment and Methodology
C. David Hardison, Health and Information Management
Ron Levine, Community Assessment and Methodology
Hugh H. Tilton, Epidemiology

Adjunct Instructor
Susan A. Randolph (35) Occupational Health Nursing

Professors Emeriti
Nora F. Cline
Marion E. Highfield
Dorothy M. Talbot
Julia D. Watkins

Courses
The Public Health Leadership program uses both PUBH and PHNU call letters for course listings. PUBH courses are open to any student unless requiring permission of instructor. PHNU courses are open to registered nurses only or by permission of instructor. Visit the website for additional information: www.sph.unc.edu/phlp.

PUBH 140 READINGS IN PUBLIC HEALTH PRACTICE (Var.). Intensive study of a special problem in public health practice. Fall, spring, and summer. Staff.

PHNU 140, 141, 142 READINGS IN PUBLIC HEALTH NURSING (1-3). Prerequisites to be arranged with the faculty. Reading and tutorial guidance in a selected area of public health nursing or occupational health nursing. Two or more hours per week. Fall, spring, and summer. Staff.

PHNU 160 DELIVERY OF COMMUNITY NURSING SERVICES (3). Permission of the instructor required. Analysis of patterns of organization of community nursing services and relationships to the health care delivery system. Special emphasis on basic management skills and their application. Staff.

PHNU 201 SPECIAL STUDIES (1-3). Permission of the instructor required. Sections focus on specific topics of current interest to health workers. Flyers describing the section offering are distributed prior to registration each semester. Lecture hours dependent upon credit. Fall and spring. Staff.

PUBH 201 SPECIAL STUDIES (1-3). Permission of instructor required. Sections will focus on specific topics of current interest to health workers. Flies describing the section offering will be distributed prior to registration each semester. Lecture hours per week dependent upon credit. Fall, spring, summer. Staff.

PHNU 216 OVERVIEW OF AGING AND CHRONIC ILLNESS (3). Course provides a sound understanding of the theories and issues related to the biological, physical, emotional, demographic, and social aspects of aging, including population-based risk factors, with emphasis on health promotion. Fall. Kincaide.

PHNU 224 SCHOOL-AGED POPULATION: HEALTH PROBLEMS AND PROGRAMS (Maternal and Child Health 224) (3). Permission of the instructor required. Health needs and problems of school-aged population. Development and evaluation of programs to meet those needs, including examination of legislative mandates, administrative structures, and manpower utilization. Three lecture hours per week. Staff.

PHNU 225 PRACTICUM: LEADERSHIP IN SCHOOL HEALTH PROGRAMS (Maternal and Child Health 225) (1-4). Permission of the instructor required. Prerequisite, Public Health Nursing 224 or equivalent. An elective, individually planned and supervised school/community based field experience. Designed to provide leadership experiences in delivery of school health services. Three to twelve laboratory hours per week. Spring. Staff.

PUBH 226 ADOLESCENT HEALTH (Health Behavior and Health Education 189, Maternal and Child Health 226) (3). Topics covered include the epidemiology of health problems, developmental issues, health services, and psychosocial influences on adolescent problem behaviors. Course material is useful for research generation and practical application. Three seminar hours per week. Spring. Foster.

PUBH 240 SPECIAL ISSUES IN PUBLIC HEALTH PRACTICE (1-3). Permission of the instructor required. Guided reading, discussions, and presentations on current and significant issues in public health. (On request.) Staff.

PHNU 240, 241 PROBLEMS IN PUBLIC HEALTH NURSING (1-4). Students study a special public health problems relevant to public health/occupational health nursing. Study will result in a paper demonstrating application of research principles. Fall, spring, and summer.

PHNU 242 INSTRUMENT DEVELOPMENT (Health Behavior and Health Education 254) (3). Prerequisite, graduate statistics and graduate methods course. This course provides a knowledge base and experiences in instrument construction and testing, emphasizing the development of psychosocial and behavioral instruments and the development of methods for field research and evaluation.

PHNU 244 ROLES AND FUNCTIONS IN PUBLIC HEALTH NURSING (3). Emerging roles and responsibilities of public health nurses and health department staff. Emphasis on program areas in health departments and public health under health care reform. Three lecture hours per week. Fall.

PUBH 245 COMMUNITY INTERACTION AND ASSESSMENT (3). Course focuses on development of knowledge and skills for interaction and assessment of population, advocacy, collaboration, partnerships, coalition building, and constituency development. Fall. Stevens.

PUBH 246 PUBLIC HEALTH PROGRAM PLANNING AND MONITORING (Health Policy and Administration 246, Maternal and Child Health 246, Health Behavior and Health Education 246, Public Health Nursing 246) (2-4). Prerequisite, two years' work experience. Permission required for nonmajors in the School of Public Health. Fundamentals of public health program planning and monitoring with emphasis on 1) applications in community settings and 2) proposals for program funding. Students earning two credits will complete a series of written exercises. For four credits, students will work in small groups to develop a complete program plan. Spring. Peoples-Shupe, Bender, Eng, Foster.
PUBH 247 MANAGEMENT PRINCIPLES AND PRACTICES (Health Policy and Administration 204) (3). Graduate students only. Provides an overview of knowledge and skills required for effective health services management. Aimed primarily at individuals who plan to assume management roles in health services and related fields. Three lecture hours per week. Fall. Staff.

PUBH 248 POLICY DEVELOPMENT (2). Permission of the instructor is required for non-SPH students. Focus is on institutional policy development, regulation and enforcement, and field observation. Spring. Multinix.

PUBH 249 PROGRAM EVALUATION (2). Permission of the instructor required. Program evaluation methods, including quantitative, qualitative, and quality assurance. Spring. Foster.

PUBH 250 STRATEGIES OF PREVENTION FOR CLINICIANS (3). Designed for those interested in the clinical arena. Establishes a framework for examining prevention activities for clinicians, then considers a number of important health problems and the evidence for applying prevention strategies to these health problems. Encourages active student participation and involves a multidisciplinary faculty. Limited to thirty students. Fall. Kinsinger. Harris.

PUBH 251 A and B SEMINAR IN CRITICAL APPRAISAL OF MEDICAL LITERATURE (Epidemiology 208 A and B) (1-2). Emphasizes the process of critical appraisal of existing research literature, with examples from a variety of areas. Students present their structured critical appraisals constitute about fifty percent of sessions. Spring, fall. Carey, Weber.

PUBH 253 COMPREHENSIVE STRATEGIES IN PUBLIC HEALTH INTERVENTION: THE CASE OF TOBACCO USE REDUCTION (3). Permission of instructor required for non-SPH majors. Using the case study of reducing tobacco consumption, this course will consider effective means of health education and health advocacy. Three lecture hours per week. Spring. Goldstein.

PUBH 260 CLINICAL MEASUREMENT/EVALUATION (Epidemiology 170) (3). Prerequisites: Epidemiology or HCA&? major. Introduction to the fundamental concepts of epidemiology, including clinical epidemiology, for clinicians. Emphasis is on applications in clinical research and practice. Fall. Miller.

PHNU 260 ADVANCED STUDIES IN ADMINISTRATION OF COMMUNITY NURSING SERVICES (3). Prerequisite, permission of the instructor. Integration of theories, concepts, methods of administration and nursing; their application to delivery of community nursing services. Emphasis placed on roles and functions of a nurse manager. Three lecture hours per week. Spring. Stevens.

PHNU 281 OCCUPATIONAL HEALTH NURSING I - OCCUPATIONAL HEALTH ASSESSMENT (3). Permission of the instructor required. Concerns factors influencing the development and operation of occupational health programs. General and special health services contingent on work environment and inherent health problems in the employed population are considered. Fall, spring, summer. Rogers.


PHNU 283 OCCUPATIONAL HEALTH NURSING, FIELD PRACTICUM I (2-3). Prerequisite or corequisite, Public Health Nursing 281. Permission of the instructor required. Students have the opportunity to discuss and apply concepts of OHN practice and the work environment. Concepts related to workplace hazards, interdisciplinary activities, and nursing interventions with worker aggregates are emphasized. Three to nine laboratory hours per week. Fall, spring, summer. Rogers.

PHNU 284 OCCUPATIONAL HEALTH NURSING, FIELD PRACTICUM II (1-3). Prerequisites, Public Health Nursing 281, 283. Corequisite, Public Health Nursing 282. Permission of the instructor required. Students have the opportunity to learn about the managerial and administrative role of the OHN. Emphasis is placed on analysis of the organizational structure, external influencing factors, and evaluation mechanisms. Fall, spring, summer. Rogers.

PHNU 285 OCCUPATIONAL HEALTH: INTERDISCIPLINARY APPROACH-ES (2). Overview course on occupational health focusing on interdisciplinary approaches to address complexities of workplace exposure, impact of work-related hazards, and interactions on health. Course offered on request. Rogers, Randolph.

PHNU 286 OCCUPATIONAL SAFETY AND ERGONOMICS (Environmental Sciences and Engineering 477) (3). Fundamentals of occupational safety and ergonomics with emphasis on legislation and organization of industrial safety and ergonomic programs, including hazard recognition, analysis, control, and motivational factors pertaining to industrial accident and cumulative trauma disorder prevention. Fall. Ostensofd, Coble.

PHNU 298 RESEARCH METHODS (2-3). Prerequisites or coerequisites, Biostatistics 101, Epidemiology 160. Permission required for nonmajors. Analysis of nursing research, emphasizing methodology and implications for community health nursing practice. For more than two credits, students must develop a research design or participate in research. Spring. Kincade.

PHNU 299 DATA MANAGEMENT (AND ANALYSIS) IN PUBLIC HEALTH (2). Prerequisites, Biostatistics 101, Epidemiology 160, Public Health Nursing 298. Focus on data management and analysis prepares the student to code and enter data, choose appropriate statistical techniques, analyze data using SAS-PC, and interpret results. Two lecture hours per week. Fall. Kincade.

PHNU 300 LEADERSHIP SEMINAR I (2). Permission of the instructor required. Public health leadership core course. Application of selected leadership skills and principles. Summer. Staff.

PHNU 301 LEADERSHIP SEMINAR II (2). Permission of the instructor required. Public health leadership core course. Application of selected leadership skills and principles. Fall. Staff.

PHNU 302 LEADERSHIP SEMINAR III (2). Permission of the instructor required. Public health leadership core course. Spring. Staff.

PHNU 303 LEADERSHIP SEMINAR IV (2). Permission of the instructor required. Public health leadership core course. Summer. Staff.

PHNU 304 CURRENT METHODS OF PUBLIC HEALTH ANALYSIS (1-3). Prerequisites of the instructor required. Public health leadership core course. Update on current methods of biostatistics, epidemiology, and automated data management. Summer. Staff.

PHNU 305 PUBLIC HEALTH POLICY DEVELOPMENT I (2-3). Permission of the instructor required. Public health leadership core course. Course uses case studies to examine social, economic, and political context within which public health policy is formulated and operationalized. Summer. Staff.

PHNU 306 PUBLIC HEALTH POLICY DEVELOPMENT II (2-3). Prerequisite, PHNU 305. Permission of the instructor required. Public health leadership core course. Course uses case studies to examine specific methods of public health policy development. Summer. Staff.

PHNU 307 COMMUNITY ASSESSMENT METHODOLOGY (3). Permission of the instructor required. Public health leadership core course. Participatory seminar examines public health tools available for community assessment. A wide range of methods is presented for gathering and analyzing information about the structure, function, resources, and perceived needs of a local community. Fall. Staff.

PHNU 308 PUBLIC HEALTH PROGRAM ASSURANCE (3). Permission of the instructor required. Public health leadership core course. Examination of the role of
public health agencies in achieving public health goals. Lecture, discussion, and case studies are used to identify the legal and public health basis for assurance activities and strategies for implementation and evaluation. Spring. Staff.

PUBH 311 LEADERSHIP, PRACTICE, AND RESEARCH I (1-2). Prerequisites: Public Health 300, 301, 302, and 303. Permission of the instructor required. Public health leadership core course. Examination of the relationships among leadership principles, applied research, and public health practice based on participants’ experiences. Spring. Staff.

PUBH 312 LEADERSHIP PRACTICE AND RESEARCH II (1-2). Prerequisite, Public Health 311. Permission of the instructor required. Public health leadership core course. Analysis of professional accomplishments in leadership, research, and public health practice and development of five- and ten-year goals in these areas. Spring. Staff.

PUBH 392 MASTER’S PAPER (3). Permission of the instructor required. A major paper on a problem relevant to public health practice. This study may extend over more than one semester. Credit is assigned accordingly. Fall, spring, summer. Staff.

PHNU 393 MASTER’S THESIS (3-9). Fall, spring, summer. Staff.

PUBH 395 DISSERTATION SEMINAR (1-2). Permission of the instructor required. Public health leadership core course. This course facilitates the integration of material from other courses for development of dissertation proposals. Fall, spring, summer. Staff.

PUBH 396 FIELD PRACTICE IN PUBLIC HEALTH (3-6). Second experience to provide opportunity to integrate course work in new health-related setting completed after regular course work and cannot be only observational experience. Report required; may be integrated with master's paper. Field fee, $200.

PHNU 396 FIELD PRACTICE IN COMMUNITY HEALTH NURSING (3-6). Permission of the instructor required. Field experience in public health nursing or occupational health nursing practice. Study and observation of selected areas related to students’ program of study. Field fee, $450. Three laboratory hours per week for each credit. Fall, spring, summer. Staff.

DEPARTMENT OF PUBLIC POLICY

MICHAEL A. STEGMAN, Chair

Professors
Richard N. L. Andrews, Environmental Policy
David D. Dill, Higher Education Policy, Concepts and Principles of Policy Analysis
Michael L. Luger, Regional Economic Development, Technology Policy,
Environmental Infrastructure and Finance, Urban Economics
Michael A. Stegman, National Housing Policy, National Urban Policy, Community Capitalism

Assistant Professors
Daniel P. Gitterman, Political Institutions/Governance, Political Economy of Regulation, Health Policy
Carolyn Heinrich, Social Welfare Policy
Krista M. Pereira, Health, Immigration, Social Welfare Policy
Shanti Rahibdian, Environmental Economics, International Environmental Policy,
Development Economics
Mort Webster, Technology, Management and Policy

Professors Emeriti
Duncan MacRae Jr., HIV/AIDS Policy, Education Policy

Adjunct Professors
Deborah Amaral, Policy Analysis, Decision Analysis, Risk Assessment and Risk Management
Peter Blair, Science and Technology Policy, Energy and Environmental Policy,

Jennifer A. Bremer, International Trade and Development
Rick Carlisle, Economic Development, Labor Force, Science and Technology Policy
Douglas Crawford-Brown, Environmental Sciences, Environmental Policy
Walter C. Farrell Jr., Health Policy and Administration, Social Epidemiology,
Community Mental Health
James J. Gallagher, Child and Family Policy, Education of Exceptional Children
Harvey A. Goldstein, Economic Development, Technology Policy, Design of Policy
Research, Planning Theory
Donald Thomas Hornstein, Environmental Policy, Administrative Law, Game Theory
Jonathan B. Howes, Environmental Policy, State and Local Government
F. Reed Johnson, Environmental and Health Economics.
James H. Johnson Jr., Interregional Black Migration, Intercultural Minority Conflict
in Advanced Industrial Societies, Minority- and Women-Owned Business Development, Workplace Diversity Issues
Michael Mungen, Policy Analysis, Statistical Methods, Political Institutions
Dennis K. Orines, Social Psychology, Work and Family Welfare Policy
Joel Schwartz, Health Policy and Politics
Gordon P. Whitaker, Public Management, Service Delivery, and Governance
Dale Whittington, International Development, Water Resources Policy,
Environmental Evaluation, Cost-Benefit Analysis

Adjunct Associate Professor
Peter VanDoren, Positive and Normative Issues in the Political Regulation of Markets

Ph.D. in Public Policy

The doctoral curriculum in Public Policy is designed to train scholars and analytical thinkers to solve real world problems that spill over traditional disciplinary lines.

Businesses and governments continually make complex decisions, often with long-term consequences. It falls to the public policy researcher to create "knowledge" to help these decision makers choose the best alternative in the "public interest." Finding appropriate analytical approaches to solve problems in public policy areas such as education, health, children and families, environment, employment, housing and urban development, trade, industry, and international affairs presents an intellectual challenge that the curriculum is designed to meet.

Critical world problems do not fit neatly into one framework. The Ph.D. curriculum in Public Policy encourages advanced theoretical exploration in multiple disciplines. The curriculum provides training in scientific theory building, but also teaches doctoral candidates to combine those skills with normative theory and prescriptive methods for policy analysis. An intelligent policy solution depends on its adoption. Therefore, students learn the political and administrative aspects of implementation in their chosen policy specialization.

The University of North Carolina at Chapel Hill has a distinguished tradition in Public Policy. Nationally and internationally recognized faculty cross department, program, and school lines in pursuit of their policy interests. Many combine scholarship with valuable governmental experience. A strong nucleus in public policy education is formed at the undergraduate level (B.A. in Public Policy), at the master's level in policy-related graduate programs offered by the departments of City and Regional Planning, Environmental Sciences and Engineering, Public Administration, Health Policy and Administration, and in the schools of Education, Law, Business Administration, Social Work, and Medicine.
The University of North Carolina at Chapel Hill hosts visiting public policy scholars from around the world and trades students and faculty with several universities in Europe and Asia. Doctoral students in the department can enroll in classes at Duke University (where there is a regular bus service) as well as N.C. State University in Raleigh without additional cost.

The Department's Research Foci and Policy Field Concentrations

Students can create their own course of study for the policy field component. The 27 credit hour requirement gives students considerable depth in the theory, substance, and analytic methods appropriate to a specific area of policy. Fifteen of the required hours (5 courses) must be in an applied area of policy, including appropriate theory. Research seminars will be offered in each of the four focus areas described below. In addition, 12 credit hours are required in research methods, to ensure that students can conduct original research. And, to understand the complexities of policy implementation, students must complete no less than 3 hours of course work in the political/administrative processes associated with their specific field.

Students can tap the considerable resources of the broader university community to support any number of policy interests. In the past, doctoral students have focused on problems ranging from comparative macro policy to health to international environmental policy to state-local public finance and services. However, the Department of Public Policy has developed particular strengths in four broad areas of policy research and application:

- **Environmental and Energy Policy.** The department coordinates teaching, research, and public service activities with the Department of Environmental Sciences and Engineering, the Carolina Environmental Program, and several academic units with environmental interests. A large number of core and participating faculty members have research projects relating to environmental issues. The department also contributes to the operation of the UNC Environmental Finance Center. (Related faculty: Andrews, Luger, Rabindran, Webster, Crawford-Brown, Whittington, Hornstein, Howes, Amaral, Rondinelli)

- **Economic Development and Science and Technology Policy.** A member of the core faculty directs the UNC Office of Economic Development, which is a pan-university unit that coordinates economic development activities on campus, helping to bring the considerable resources of the University to bear on problems related to income, job, and wealth creation in North Carolina, the southeast, the nation, and the world. The department works closely with other core units on campus with strength in economic development and science and technology policy, including the departments of City and Regional Planning, Sociology, and Economics; the School of Government; units in the School of Public Health; and the schools of Law and Business. Students have ample opportunities to work with economic development and science and technology organizations that are located in the region, including the Southern Growth Policies Board, Rural Economic Development Center, Southern Technology Center, Sigma Xi, science fraternity, and others. (Related faculty: Luger, Dill, Stegman, Webster, Whittington, Goldstein, Carlisle, Tauchen, Kasarda, Bremer, Johnson, F. Reed Johnson)

- **Social Policy, Including Welfare, Education, and Low-Income Communities.** This area of application revolves around activities in two centers: the Center for Community Capitalism, which is a cooperative effort between the department and the Kenan Institute of Private Enterprise, and the Jordan Institute of Family Policy, in the School of Social Work. In addition, two public policy faculty members in this area have joint appointments in the School of Education. (Related faculty: Dill, Gitterman, Heinrich, Luger, Petraeus, Stegman, Orthner, Gallagher, Howes, Kasarda, MacRae, J. Johnson, Farrell, Schwartz)

- **Health Policy.** Faculty in Public Policy study issues relating to mental health and substance abuse, AIDS, environmental health, health insurance and managed care, and health issues in developing countries, all with a focus on the economic and institutional basis of good policy making. The Public Policy faculty connect the unit to considerable resources outside Public Policy, in the School of Public Health, the Department of Social Medicine, the Carolina Population Center, neighboring universities, contract research organizations, and international donor organizations. (Related faculty: Gitterman, Petraeus, MacRae, Schwartz, Stewart, F. Reed Johnson)

Public Policy Seminar

The department offers a weekly seminar series in which faculty, public policy scholars, government officials, and public policy doctoral students present their research and share their perspectives on policy issues. The seminars give students the opportunity to assess the relevance of their theoretical, analytic, and political training to the real world of policy analysis.

Graduate Minor

Doctoral and master's students not enrolled in the Department of Public Policy may elect to minor in Public Policy.

Department Requirements

The Core

The first four semesters of study build a solid foundation for the Ph.D. in Public Policy. All core courses are designed specifically for public policy doctoral students. While maintaining a focus on state-of-the-art policy analysis methods and techniques, the courses also use case study materials to illustrate the significance of political constraints and policy choices.

- **Economic Analysis and Public Policy I and II** (two courses). These courses provide advanced treatment of economic theory for application to such topics as industrial organization and regulation, tax policy, welfare economics, income distribution, insurance, business location and investment, national industrial policy, and labor markets and employment.

- **Public Institutions and Policy Actors.** This advanced course covers the operation of public policy-making institutions and processes, the behavior of individuals and groups involved in public policy making, and the interaction of governmental institutions in the formulation and implementation of policies.

- **Models, Methodology and Research Design I and II** (two courses). These courses teach policy-oriented researchers how to structure a research design and apply research techniques that are appropriate to public policy problems and generate knowledge that is directly useful to decision makers.

- **Ethics and Formal Analytic Techniques I and II** (two courses). Ethical considerations in policy advising are integrated with formal analytical approaches to decision making. These considerations include criteria for policy choice, user participation, and the analyst's obligations. The first semester deals with noneconomic techniques. The second semester deals with economic techniques, especially cost-benefit analysis. The course also explores the use of formal decision methods in the political process.

- **Public Policy Analysis Seminar** (two semesters, one credit hour each). See above.

Students who have not had a similar course elsewhere are also expected to enroll in Public Policy Analysis.

Admission

Applications for admission in the fall semester are received and reviewed throughout the year. However, applications must be received by December
31 of the year before fall admission is desired to receive full consideration for Graduate School competitive awards, and by January 1 to be considered for available department assistantships.

The admission process is highly competitive. All prospective students must take the Graduate Record Examination (GRE), and applicants from non-English-speaking countries must also submit results of the Test of English as a Foreign Language (TOEFL).

No single credential is regarded as qualifying or disqualifying. Factors considered in the application review include the academic transcript, GRE scores, class rank, references, strength of undergraduate institution, and statements of interest and professional experience. Applicants are expected to demonstrate an ability to think creatively, analytically, and critically. This may be demonstrated through prior course work. If course work deficiencies are identified in otherwise promising applicants, the student may be required to enroll in master's level courses prior to admission into the Ph.D. program.

Applicants are encouraged to visit the campus for a personal interview with the faculty.

Resources
When admitted, students are automatically considered for a range of financial support including Graduate School fellowships, teaching assistantships, and research assistantships. Many awards grant full tuition privileges and medical insurance coverage, substantially increasing their value to the student.

An impressive array of University of North Carolina institutes and centers also extend research opportunities. These institutes, many having achieved national and international distinction, are rich resources for doctoral students.

**The University of North Carolina at Chapel Hill Carolina Institute for Child and Family Policy**
Conducts policy-oriented research on issues around children and families (formerly the Bush Institute).

**Carolina Population Center**
Coordinates university-wide programs on national and international population research.

**Cecil G. Sheps Center for Health Services Research**
Study of health care delivery.

**Center for Urban and Regional Studies**
Multidisciplinary research on urban issues and the process of urbanization such as new community development, housing market dynamics and national home ownership policies, models of urban growth, residential preferences, coastal zone management, and planning for natural hazards.

**Frank Hawkins Kenan Institute of Private Enterprise**
Fosters mutual understanding among people working in business, academia, and government to encourage cooperative efforts to strengthen private enterprise systems in the United States and worldwide.

**Center for Community Capitalism**
The mission of the center is to help fight poverty and inequality by creating more effective strategies to reintegrate America's disadvantaged communities and their residents into the market economy.

**Center for Competitiveness and Employment Growth**
Researches demographic, economic, and political forces underlying competitiveness, productivity, and job creation dynamics for private and public sectors.

**Center for International Trade and Investment Promotion**
Establishes joint ventures and other cooperative mechanisms between United States businesses and Central European firms seeking to privatize their enterprises. Provides guidance on the development and management practices in specific sectors, market opportunities, organizational structures, and technology transfer.

**The International Private Enterprise Development Research Center**
Studies the role of private enterprise in economic development worldwide. Conducts applied research on the global business environment and analyzes policies related to private enterprise development.

**The Office of Economic Development**
The OED's mission is to apply the resources at UNC-Chapel Hill to the problems of economic development, primarily within the state of North Carolina. The OED is a pan-university activity and is housed in the Kenan Institute for Private Enterprise.

**Frank Porter Graham Child Development Center**
Pursues research to create new knowledge to enhance the lives of children and their families.

**Highway Safety Research Center**
Research on prevention of collisions and injuries for state and local highway safety agencies.

**Institute for Environmental Studies**
Supports multidisciplinary research on broad aspects of environmental quality in the natural and social sciences, engineering, and public health.

**Institute for Transportation Research and Education**
Provides highway and transportation engineering research and technology transfer to local, state, and federal government agencies.

**The Jordan Institute for Families**
The institute was created in 1996 in the School of Social Work to promote research and development efforts in new and innovative directions and to improve the quality of services delivered to communities across the state and nation. It maintains four basic missions: (1) to facilitate faculty research; (2) to provide opportunities for students to work on research and development projects in the areas of human services; (3) to build professional relationships with research laboratories and centers across the campus; and (4) to serve as a resource to human service departments and programs in North Carolina.

**Odum Institute for Research in Social Science**
Oldest institute in the United States for the cooperative study of problems in the general field of social sciences; maintains extensive survey and census archives.

**School of Government**
Provides teaching, research, and consultation to North Carolina state and local government officials.

**Water Resources Research Institute**
Formulates research programs responsive to state water resource problems. Provides local, state, and federal agencies with research to make better decisions in managing water resources.

Write or call for application materials:
Admissions
Department of Public Policy
Campus Box 3435, Abernethy Hall
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3435
(919) 962-1600
Web: www.unc.edu/depts/pubpol
Graduate Courses

106 MICROECONOMICS: THEORY AND APPLICATION (ECON 100) (3).
Analysis of the ways in which consumers and business firms interact in a market economy. Fall and spring. Staff.

111 ENVIRONMENTAL ECONOMICS AND POLITICS (3).
Explores the microeconomic foundations of environmental problems and their solutions, including property rights, externalities, public goods, justice and equity, and future generations and discounting. NOT an introduction to the major modern environmental regulations. Spring. Staff.

120 ENVIRONMENTAL DECISION-MAKING (ENST 120) (3).
Introduces factors shaping environmental decision-making by individuals, businesses, governments, advocacy groups, and international institutions, and explores public policy incentives and action strategies for influencing them.

130 RACE, POVERTY, PUBLIC POLICY IN THE UNITED STATES (3).
Definitions of poverty and their policy implications; the composition and causation of poverty; an assessment of the success and/or failures of public policies directed at the alleviation, reduction, and elimination of poverty. Fall. Schwartz.

161 HEALTH POLICY AND POLITICS (3).

175 QUANTITATIVE ANALYSIS FOR PUBLIC POLICY (POLI 175, PLAN 175) (3). Prerequisite: STAT 31. Application of statistical techniques, including regression analysis, in public policy program evaluation; research design and data collection and management. Fall, spring, and summer. Staff.

179 SCIENCE AND POLICY (3).
The problems of using expert knowledge in democratic policy formation. The relationship between science and policy; the role of experts in policy-making; the use of scientific information and personnel in decision-making. Spring. Staff.

185 AMERICAN ENVIRONMENTAL POLICY (ENVR 185, PLAN 185, ENST 185) (3).
Intensive introduction to environmental management and policy, including environmental and health risks, policy institutions, processes, instruments, policy analysis, and major elements of American environmental policy. Lectures and case studies. Fall. Andrews.

190 SEMINAR IN DOMESTIC POLICY (POLI 190) (3).
Taught as part of the UNC Washington Semester Program, the course introduces students to domestic policymaking from the federal perspective, using readings and lectures from the Washington policymaking community. Fall. Segnan.

198 SELECTED TOPICS IN PUBLIC POLICY ANALYSIS (3).
Special topics in Public Policy Analysis, including computer applications and case studies. Fall and spring. Staff.

204 AMERICAN POLITICAL INSTITUTIONS (POLI 204) (3).
Theory and practice of political institutions in the American context. Fall, spring, Staff.

205 PUBLIC POLICY ANALYSIS (3).
The roles of expertise in policy discourse; the place of values in policy analysis; summarizing preferences; benefits and costs; policy models; policy expertise and democratic political systems. Fall. Staff.

208 MODELING FOR ENVIRONMENTAL RISK MANAGEMENT (ENVR 279, POLI 208) (3). Prerequisite: ENVR 180. Quantitative techniques for the analysis of environmental decisions, including application of modeling and sensitivity analysis, probability, value of information. The course explores risk attitudes and conflicting objectives. Fall. Staff.

210 PUBLIC ORGANIZATION THEORY AND BEHAVIOR (PADM 210) (3).
Exposition, comparison, and case-based application(s) of basic models of organizations, with emphasis on public sector entities. Fall. Whitaker, Carlson.

211 PUBLIC MANAGEMENT AND LEADERSHIP (PADM 211) (3).
Development of administrators' skills in working with others to accomplish organizational goals. Conceptual and experimental models of learning used to examine a variety of administrative behaviors. Spring. Whitaker, Carlson.

212 INTRODUCTORY POLICY EVALUATION METHODS (PADM 212) (3).
The application of statistical methods to problems of evaluation of public programs and problems facing public managers. Theory and basic techniques up to an introduction of linear regression analysis. Fall. Staff.

214 GOVERNMENT BUDGETING AND FINANCE (POLJ 214) (3).
An introduction to the revenue and expenditure structure of the public sector including revenue policy, expenditure policy, and budget structure and administration. Topics are examined from an applied perspective using analytic criteria from public sector economics, public administration, and political science. Spring. Lowery.

216 NEW INSTITUTIONALISM AND GOVERNANCE (POLJ 216) (3).
Examines leading theoretical approaches to study of governance and public policy. Draws on "new institutionalism" scholarship from political science, economics, and sociology to analyze public policy in historical and comparative perspective. Emphasis on applying these theoretical insights to real-world issues of governance and public policy. Spring. Gitterman.

219 POLITICS OF THE ADMINISTRATIVE PROCESS (POLI 219) (PADM 219) (3).
The motivations of public agency officials, interactions between bureaucrats and other political actors, and alternative strategies to control bureaucratic power and discretion in making, implementing, and evaluating public policies. Fall. Lowery.

221 PUBLIC POLICY AND ADMINISTRATION (POLI 221) (3).
Alternative explanation of public policies and policy-making processes; introduction to policy analysis as a way to inform choices among policy options; policy implementation through administrative practices and procedures. Fall or spring. Staff.

226 STATE AND LOCAL PUBLIC FINANCE I (PLAN 226) (3). Prerequisite, PLAN 210 or intermediate microeconomics. Analysis of tools used to finance infrastructure and services essential for economic development, especially by state and local government. Emphasis on revenue side (taxes, fees, charges) including use of bonds. Includes institutional design and case studies. Spring. Luger.

231 ETHICS AND FORMAL ANALYTIC TECHNIQUES I (3).
Ethical considerations are integrated with formal analytical approaches in policy advising. Topics include criteria for policy choice, user participation, and analysts' obligations in political situations. First semester: noneconomic techniques. Fall. Webster.

232 PUBLIC INVESTMENT THEORY AND TECHNIQUES (ENVR 232, PLAN 232) (3).
Theory and techniques of public investment planning and cost-benefit analysis involving synthesis of economic, political, and technologic aspects. Special focus on project and program evaluation in the Third World. Spring. Whitinington.

233 ETHICS AND FORMAL ANALYTIC TECHNIQUES II (3).
Ethical considerations are integrated with formal analytical approaches in policy advising. Topics include criteria for policy choice, user participation, and analysts' obligations in political situations. Second semester: mainly cost-benefit analysis. Spring. Rabindran.

235 VALUES AND ETHICAL PERSPECTIVES ON PUBLIC POLICY (PADM 235) (3).
Understanding and clarifying the valuation base of administrative and policy choices. Ethical problems encountered in public officials' personal actions. Fall. Staff.

237 METHODS FOR POLICY ANALYSIS AND EVALUATION (POLI 237, SOCI 237) (3).
Prerequisites, PSY/PSY 212, PLAN 130, or equivalent. Introduction to selected techniques such as the following: multiple regression, decision theory, research design, social experiments and quasi-experiments, program evaluation, and policy-related models. Spring and summer. Lowery.
253 ENVIRONMENTAL POLICY ANALYSIS (ENVR 287) (3). Prerequisite, ENVR 190/PLCY 153 and instructor permission. Advanced topics and applications in environmental policy analysis. Three lecture hours a week. Fall and spring. Andrews.

258 SEMINAR IN COMMUNITY CAPITALISM (PLAN 258) (3). Limited to graduate students. Reflects convergence of business and community development interests. Seminar explores theory and applications in inner city business and capital markets, development finance, urban policies. Requires major research project. Fall. Stegman.

260 COMMUNITY CAPITALISM I (BUSI 299B) (1.5). Seminar explores community capitalism perspectives with emphasis on capital formation and innovations in community development finance and business-driven investment strategies. Spring. Stegman.

261 COMMUNITY CAPITALISM II (BUSI 299C) (1.5). Prerequisite, PLCY 260 or permission of instructor. Builds on Community Capitalism I. Seminar explores community development technological innovations in financial services industry, implications of asset building strategies for low income communities, and investment opportunities in inner city markets. Spring. Stegman.

288 ADVANCED ECONOMIC ANALYSIS FOR PUBLIC POLICY I (PLAN 288) (3). Economic theory applied to policy issues. Policy issues analyzed require microeconomic theory, including theory of utility and demand, organization and operation of product and factor markets, production theory, regulation, and welfare economics. Fall. Staff.

289 ADVANCED ECONOMIC ANALYSIS FOR PUBLIC POLICY II (PLAN 289) (3). Prerequisite, PLCY 288. Additional public policy issues addressed to study further applications of economic theory. Issues require knowledge of risk and uncertainty, fiscal and monetary theory, and macro income determination. Spring. Staff.

298 PUBLIC POLICY WORKSHOP (1-3). For graduate students in Public Policy Analysis to undertake team projects under faculty supervision. Projects vary from year to year. All will relate to public policy and will involve interaction with real clients. The intent is to provide students with an opportunity to apply theory and techniques of policy analysis in actual problem situations. Fall and spring. Staff.

299 INDEPENDENT STUDY (Var.). This course allows graduate students in Public Policy Analysis to receive credit for work on individual projects, designed in conjunction with a faculty supervisor. It is intended for students who are interested in pursuing academic topics not covered in scheduled courses. Fall and spring. Staff.

300 THE USE OF RESEARCH IN THE POLICY PROCESS (3). Systematically examines use and abuse of policy-relevant research in policy process; connects design and execution of policy research with participants in policy process; policy cases are emphasized. Fall. Staff.

301 DESIGN OF POLICY-ORIENTED RESEARCH (PLAN 301) (3). Logic of designing research for the analysis of planning problems and the formulation of public policies. Elements of research design, case study, survey research, quasi-experimental designs, and the social experiment are covered. Spring. Goldstein.

302 ADVANCED SEMINAR IN RESEARCH DESIGN: DATA, METHODS, AND EVALUATION (PLAN 302) (3). Prerequisite, PLCY 301. Three main objectives: to deepen students' understanding of important issues and topics in the design of empirical research, to develop the students' ability to critically evaluate research designs, and to aid in developing research design, dissertation, or other product. Spring. Heinrich.

303 ADVANCED SEMINAR IN RESEARCH DESIGN: RESEARCH DESIGN PRACTICUM (PLAN 303) (3). Prerequisites, PLAN/PLCY 301 AND PLAN/PLCY 302. Applications of skills in research design and methods through a semester-long research project resulting in an article or research report of publishable quality. Fall. Burby.

310 PUBLIC POLICY SEMINAR (1). Weekly forum for public policy scholars and officials to discuss the relationships between policy research and policy outcomes. Presentations by invited speakers and doctoral students. Fall. Stegman.

353 PH.D. SEMINAR IN ENVIRONMENTAL MANAGEMENT AND POLICY (ENVR 353) (1). Prerequisites, doctoral standing and permission of the instructor. Ph.D. seminar on theory, methods, and current research and literature in environmental management and policy. One to two seminar hours per week. Fall, spring, summer. Andrews.

355 PH.D. SEMINAR IN ECONOMIC DEVELOPMENT AND SCIENCE AND TECHNOLOGY POLICY (PLAN 355) (3). Prerequisites, doctoral standing and permission of the instructor. Explores current issues in economic development and science and technology policy through a series of scholarly presentations and student research projects. Spring. Luger.

357 PH.D. SEMINAR IN SOCIAL AND WELFARE POLICY (3). Prerequisites, doctoral standing and permission of the instructor. Fall, spring. Stegman. Ortner.

394 DOCTORAL DISSERTATION (Var.). Staff.

701 SOCIAL WELFARE POLICY (SOCW 701) (3). Prerequisite, doctoral standing or permission of instructor. Review of developments in United States welfare policy and economic, social, and political forces underlying reform initiatives since the 1960s. Analysis of data on impacts of welfare policies and programs. Ortner.

DEPARTMENT OF RECREATION AND LEISURE STUDIES

KARLA A. HENDERSON, Chair

Professors
M. Deborah Bialecki (2) Leisure Attitudes and Behaviors, Outdoor Recreation, Women's Leisure
Karl A. Henderson (1) Women's Leisure, Social Psychology of Leisure, Outdoors, Research Methodologies

Associate Professor
John L. Hemingway (3) Leisure Theory, Administration, Legal Issues, Risk Management

The Department of Recreation and Leisure Studies provides an interdisciplinary approach to leisure studies and the preparation of specialists to work in the field of parks, recreation, and leisure services. The department's mission is to train professionals who will be prepared to address the changing leisure and recreation interests and needs of all people, with an emphasis on inclusion and social justice.

The department offers the Master of Science degree in Recreation Administration (M.S.R.A.) at the graduate level. Two specializations, therapeutic recreation and recreation management, are available.

This professional degree program combines both academic and practical experience. It is individualistic. Specific requirements depend upon the student's undergraduate major, work experience, and professional objectives. A minimum of twenty-one to thirty credits of coursework in Recreation and Leisure Studies (RECR) is required; the remaining credits of the 33-36 semester credit program may be taken in RECR and/or related areas of study depending upon the student's career goals.

All students admitted to this program must fulfill the requirements for admission to the Graduate School. The Graduate School requires satisfactory performance on the Graduate Record Exam (GRE) and an acceptable GPA. In addition, applicants must have prerequisite training equivalent to an undergraduate major in one of the following areas: recreation, education, political science, dramatic art, special education, physical education, psychology, sociology, or another related area.

The M.S.R.A. degree requires two years to complete. In addition to ten courses (thirty semester credits), students may choose from among three options to fulfill the degree requirements: 1) a thesis (three credits), 2) a twelve-week (minimum) internship (four credits), or 3) six credits of inde-
pendent field study. This choice is based upon students' interests, past experiences, and future professional plans. Students who wish to do further graduate work or seek an academic career in Recreation and Leisure Studies normally elect the thesis option. For students who have full-time experience in any area of recreation services or who are employed as recreation specialists while pursuing their graduate degree, the six credits of independent field study are recommended. Students with limited practical experience who seek a practitioner's role upon graduation are advised to choose the internship option. For students interested in meeting eligibility requirements for certification by the National Council on Therapeutic Recreation Certification and who have not previously completed an approved field experience, the internship is required.

All candidates for the M.S.R.A. degree are encouraged to pursue concurrent work experience with their coursework. No academic credit is given for this experience, but it is an important expectation. A variety of opportunities exist through the cooperative efforts of various recreation services and agencies within the University and surrounding communities. Research and teaching assistantships also may be available.

More information is available on the web at www.unc.edu/depts/recreate.

Courses for Graduates and Advanced Undergraduates

101 WOMEN, WORK, AND LEISURE (Women's Studies 101) (3). Implications of the relationship between women and leisure from a lifestyle perspective, and an analysis of the changing role of women and changing leisure concepts from a feminist perspective. Spring, Henderson, Bialeschki.

112 LEISURE IN A DIVERSE SOCIETY (3). An analysis of diverse populations and the meaning and impact of leisure on the lives of these individuals. Race, class, gender, culture, age, disability, employment, and sexual orientation are related to implications for leisure. Fall.

120 PROGRAM PLANNING FOR RECREATION SERVICES (3). Prerequisite, RECR 10. A study of the principles of planning recreation programs and the factors which affect their implementation and functioning. Fall, Bialeschki.

130 INTRODUCTION TO GROUP DYNAMICS AND COMMUNITY LEADERSHIP (3). An analysis of the techniques, methods, and motives of group and community leaders. Focus on the roles of organizational structure, personnel policies, and in-service training programs. Spring.

140 RECREATION SPACES: THEIR DESIGN AND USE (3). Principles of planning recreation areas and facilities and the relationship of human needs to environmental resources. Spring. Staff.

150 EVALUATION OF RECREATION SERVICES (3). Techniques and application of various methods for evaluating organized recreation services and programs. Spring, Henderson.

160 ADMINISTRATION OF RECREATION SERVICES (3). Analysis of recreation from the standpoint of organization, administration, finances, training, legislation, public relations, and coordination of community resources. Fall. Hemingway.

175 INTRODUCTION TO THERAPEUTIC RECREATION SERVICES (3). History and philosophy of therapeutic recreation. A survey of basic counseling/interactional styles, classroom and administrative skills, and interdisciplinary approaches to a variety of clinical settings. Fall. Staff.

176 CLINICAL SKILLS IN THERAPEUTIC RECREATION (3). Development of helping skills for the practice of therapeutic recreation emphasizing rationale, techniques, and role responsibilities of therapeutic recreation in the area of leisure education. A 20-hour practicum is required. Fall. Staff.


199 SELECTED ISSUES SEMINAR (1-3). Current issues, techniques, and research of a topical short-term nature are the focus of these seminars. May be repeated for up to six credits. Staff.

Core Courses for Graduates

210 WORK, LEISURE, AND ORGANIZED RECREATION IN THE UNITED STATES (3). A description and analysis of the scope of organized recreation systems, the evolution of work and leisure attitudes, and the trends of individual recreation behavior. Fall. Henderson.

230 MANAGING ORGANIZATIONAL BEHAVIOR IN RECREATION SERVICES (3). This course addresses organizational behavior and theory to promote insight into micro and macro issues confronting professionals in organized recreation services. Spring, Hemingway.

250 RESEARCH DESIGN AND METHODS I (3). An appraisal of current recreation research. Introduction to statistical techniques and analysis; application of quantitative methods to research problems. Spring, Bialeschki.

251 RESEARCH DESIGN AND METHODS II (3). Prerequisite, RECR 250 and a course in statistics. Students review qualitative research methods and apply them to recreation issues. Design and preparation of a research proposal and completion of a mini-research project. Fall. Bialeschki.

310 SEMINAR IN LEISURE STUDIES (3). A survey of contemporary views of society and their structures and functions, as they relate to concepts of leisure and recreation behaviors. Fall and spring. Staff.

Specialization Courses for Recreation Management

260 HUMAN RESOURCE MANAGEMENT IN RECREATION SERVICES (3). Analysis of recreation services from the standpoint of human resource planning, job analysis, recruitment, training, performance appraisal and compensation of paid staff. Human resources management issues related to volunteers are also discussed. Spring. (Alternate years.) Staff.

265 STRATEGIC MANAGEMENT OF RECREATION SERVICES (3). A focus on the strategic processes important to recreation organizations: management, marketing, and finance. Strategic management, the major emphasis of the course, is the spine onto which marketing, and finance will be integrated. (Alternate years.) Staff.

365 RECREATION MANAGEMENT SEMINAR: SELECTED TOPICS, PROBLEMS, AND ISSUES (3). The purpose of this seminar is to involve graduate recreation management students in an in-depth consideration of selected topics relevant to the recreation administrator/manager in commercial, nonprofit, and public service agencies. Spring. (Alternate years.) Henderson.

Specialization Courses for Therapeutic Recreation

270 ADMINISTRATION OF THERAPEUTIC RECREATION SERVICES (3). Emphasis on information specific to the administration of therapeutic recreation such as fiscal management, quality assurance, evaluation, marketing of therapeutic recreation, and other general administrative topics. Spring. (Alternate years.) Staff.

275 PRINCIPLES AND PROCEDURES IN THERAPEUTIC RECREATION (3). A study of the existing practices and principles of therapeutic recreation. An in-depth treatment of assessment/evaluation, goal setting and individualized planning, documentation, leisure counseling, and clinical skills. Spring. (Alternate years.) Staff.

376 ISSUES AND PROBLEMS IN THERAPEUTIC RECREATION (3). An in-depth treatment of various issues, problems, and concerns such as professionalism, credentialing, accessibility, mainstreaming, recent legislation, and others as they relate to the provision of therapeutic recreation services. Spring. (Alternate years.) Staff.
Option Requirements for Degree

280, 281 INTERNSHIP IN RECREATION ADMINISTRATION (2, 2). Fall, spring, and summer. Staff.

290 INDEPENDENT FIELD STUDY (3). Permission of faculty. May be repeated for credit. Fall and spring. Staff.

393 THESIS (3). Staff.

DIVISION OF REHABILITATION PSYCHOLOGY AND COUNSELING

LEE K. MCLEAN, Director

Associate Professors
Eileen J. Burke (22) Behavioral Medicine/Health Psychology, Religiosity, Spirituality, and Quality of Life Associated with Heart and Lung Transplantation; Psychological Aspects of Cardiac and Pulmonary Rehabilitation
Cynthia L. Wilhelm (5) Pediatric/Adult Rehabilitation Psychology, Psychosocial Adjustment of Disability, Disability Evaluation/Management, Life Care Planning

Clinical Professor
J. Gregory Olley (20) Developmental Disabilities, Development of Social Behaviors, Staff Development, and Human Services

Clinical Assistant Professor
Stacia A. Carone (27) Counselor Supervision, Adolescent Sexual Offender Rehabilitation, Mental Health Interventions, Counseling in Private Practice

The Division of Rehabilitation Psychology and Counseling (DRPC) of the Department of Allied Health Sciences offers a two-year graduate program leading to the Master of Science degree.

Mission, Goals, Objectives

The mission of the Division of Rehabilitation Psychology and Counseling is to educate competent and innovative rehabilitation psychologists-counselors. In carrying out this mission, the faculty are committed to full inclusion and integration of all individuals with disabilities as equally valued members of society. The faculty strongly believe in and promote the concept of wellness and the prevention of disability and disease.

The DRPC’s commitment includes maintaining a leadership role in the education of scholars/practitioners through research, service, and applied practice in rehabilitation psychology and counseling with the expectation that these activities will result in an expanded knowledge base that will improve traditional rehabilitation services and lead to the development of innovative services to meet the evolving needs for rehabilitation.

Objectives

Upon completion of the program in rehabilitation psychology and counseling all students will have:

- the ability to assess, develop, and implement the client’s rehabilitation needs through appropriate counseling and service plans;
- the ability to write coherent and specific case notes, reports, and summaries;
- the ability to assume an advocacy role for clients;
- the capacity to provide vocational counseling services;
- the capacity to function in related roles including case manager;
- the ability to identify rehabilitation program and professional staff needs to develop corresponding research, in-service training programs, and/or team leadership skills;
- the capacity to work successfully and effectively in a multidisciplinary rehabilitation setting.

In addition, the DRPC provides opportunities for students to explore their capacity and potential in the areas of leadership and research, giving them:

- the ability to evaluate new information and research findings and to incorporate this information into practice;
- the ability to participate in the development of new information and knowledge through the research process.

The graduate courses offered in rehabilitation psychology and counseling present and discuss theoretical constructs and their application to clinical practice, stimulate critical, analytical, and creative thought; and prepare students for professional positions in private and public rehabilitation programs.

Students must successfully complete sixty-eight semester hours of required and elective coursework, as well as an approved internship. The successful candidate will also have passed the master’s comprehensive examination, prior to or concomitant with the defense of an approved master’s thesis, paper, or project.

Requirements for Admission

- A bachelor’s degree with a major in psychology, sociology, special education, business administration, or related areas from an accredited college or university;
- A grade point average of B (3.0 on a 4.0 scale) or better in the area of the major;
- Submission of Graduate Record Examination (GRE) scores;
- Three letters of recommendation;
- Completion of supplemental application provided by the DRPC;
- Possible pre-admission interview with the DRPC faculty.

Courses for Graduates

200 INTRODUCTION TO REHABILITATION PSYCHOLOGY AND COUNSELING (3). Introduction to principles and practice of rehabilitation, including the psychological and social aspects of disability. Three lecture hours per week. Fall. Staff.

202 THEORIES OF COUNSELING APPLIED TO REHABILITATION (3). Introduction to theories of counseling and behavior as they apply to rehabilitation settings and populations. Emphasis is on generation of effective treatment models. Three lecture hours per week. Fall. Staff.

204 MEDICAL ASPECTS OF REHABILITATION (3). Orientation to the disease or disability processes and intervention using principles of medicine and rehabilitation. Three lecture hours per week. Spring. Sakata.

206 MEASUREMENT AND EVALUATION IN REHABILITATION (3). Students learn assessment and evaluation techniques used in rehabilitation settings. The course includes performance measures, work samples, and job simulation. Three lecture hours per week. Spring. Staff.

208 CAREER DEVELOPMENT AND SELECTIVE PLACEMENT IN REHABILITATION (3). Orientation to career development theory and vocational information applicable to rehabilitation settings. Also presented are selective placement considerations for the severely disabled. Three lecture hours per week. Fall. Staff.

210 REHABILITATION PSYCHOLOGY AND COUNSELING PRACTICUM (6). Prerequisites: Rehabilitation Psychology and Counseling 200, 202, 306. A supervised clinical experience in techniques of interviewing, case planning, and case management. Six lab hours per week. Fall/Spring. Staff.

212 REHABILITATION OF PSYCHOSOCIAL DISABILITIES IN REHABILITATION PSYCHOLOGY AND COUNSELING (3). Prerequisites: Rehabilitation Psychology and Counseling 200, 202. Introduction to treatment information and strategies for counseling interventions related to psychiatric rehabilitation. Three lecture hours per week. Spring. Staff.
214 PRINCIPLES OF GROUP COUNSELING IN REHABILITATION PSYCHOLOGY AND COUNSELING (3). Introduction to theories, principles, and research in small group counseling techniques useful in treatment of the severely disabled. Three lecture hours per week. Fall, Wilhelms.

218 LAB-REHABILITATION AND SMALL GROUP BEHAVIOR (2). Prerequisite, permission of the instructor. The laboratory education model of learning is used to teach group dynamics from an experiential point of view. Students are exposed to training group theory and practice through the experiences generated from participation in small group activities. Fall, Staff.

300 RESEARCH IN REHABILITATION PSYCHOLOGY AND COUNSELING (3). Prerequisites: Rehabilitation Psychology and Counseling 200, 202, and permission of the instructor. An introduction to research models and models encountered in rehabilitation. Emphasis is on the utilization of research findings in the treatment process. Three lecture hours per week. Fall, Sakata.

302 ADVANCED TECHNIQUES IN REHABILITATION PSYCHOLOGY AND COUNSELING (5). Prerequisites: Rehabilitation Psychology and Counseling 200, 202, 210, 300. Emphasizes the refinement of counseling skills and techniques, development of integrated plans, and models for rehabilitative intervention. Three lecture hours and sixteen hours of field work per week. Fall, spring, or summer. Staff.

304 SPECIAL TOPICS IN REHABILITATION PSYCHOLOGY AND COUNSELING (Var.). While not usually a formal course, this section provides an opportunity for students to develop an in-depth knowledge of specific areas of rehabilitation including vocational education, independent living, private rehabilitation, the use of computers, other technology, etc. May be repeated for credit. Fall, spring, or summer. Staff.

306 PROBLEMS IN REHABILITATION PSYCHOLOGY AND COUNSELING (Lab) (5). Prerequisite, permission of the instructor. Individually guided study or research in rehabilitation psychology and counseling. May be repeated for credit. Five lab hours per week. Fall, Burker, staff.

308 APPLICATION OF SMALL GROUP THEORY AND INTERVENTION TECHNIQUES IN REHABILITATION PSYCHOLOGY AND COUNSELING (3). Prerequisites: Rehabilitation Psychology and Counseling 214 or equivalent and permission of the instructor. An advanced course designed to provide the prospective group counselor with a substantial overview of current theory, research, and practice in small group intervention. Seminars and experimental learning modules provide the opportunity for the acquisition of basic leadership skills in rehabilitation. Fall, Staff.

310 INTERNSHIP IN REHABILITATION PSYCHOLOGY AND COUNSELING (12). Prerequisites, all Rehabilitation Psychology and Counseling course work and permission of the instructor. Full-time supervised clinical counseling experience integrates previous academic and field experiences into working models. Forty clinical hours per week. Spring, summer, fall. Staff.

392 MASTER’S PAPER/MASTER’S PROJECT (3). Fall, spring, and summer. Staff.

393 MASTER’S THESIS (3). Fall, spring, and summer. Staff.

DEPARTMENT OF RELIGIOUS STUDIES

BART D. EHRMAN, Chair

Professors
Carl W. Ernst (42) Islamic Studies, Sufism, South Asia
Peter I. Kaufman (16) History of Christian Traditions; Patristic, Medieval, and Reformation Studies
Thomas A. Tweed (47) Historiography of Religions in America, Asian Religions in America
Ruel W. Tyndall Jr. (13) Philosophy and Anthropology of Religion, Ethics and Rhetoric

Associate Professors
Yakov S. Ariel (68) Judaism in America, American Evangelicalism and Premillennialism, Christian-Jewish Relationship
Armin Lange (53) Hebrew Bible, Dead Sea Scrolls
Laurie Maffly-Kipp (28) History of Religion in America, African American Religion
James H. Sanford (8) Far Eastern Religions, Japanese Buddhism
Joanne P. Waghorne (17) History of Religion, Religions in India, Contemporary Hinduism

Assistant Professors
Lance Lazar (51) Medieval and Early Modern Religious Studies
Zlatko Plese (49) Religion in Late Antiquity
Randall S. Perry (52) Critical Approaches to the Study of Religion, Modern Western Religious Thought

Adjunct Professors
Judith Fairhat, Chinese Medicine
Philip Gura, Religion and American Literature
Paul W. Meyer, New Testament and Early Christianity
Albert Rabih, Renaissance and Early Modern History, Women’s Studies

Adjunct Associate Professors
Jonathan Hess, Modern Judaism
Tony K. Stewart, Vaishnavism and Islam in South Asia
Margaret Wiener, Indonesian Religions

Adjunct Assistant Professors
Charles Kurzman, Islamic Movements
Barry Saunders, Ritual Studies and Biomedicine

Professors Emeriti
John W. Dixon Jr.
William J. Peck
Jack M. Sasson
John H. Schutz
John Van Seters

The graduate program in Religious Studies at the University of North Carolina at Chapel Hill deals with religion both as a distinctive human experience and as a mode of culture and history. Both orientations define religion as a broad area of human existence, and students are encouraged to explore the tension between those two general approaches. The interests of the department’s faculty express the variety of methodological orientations in such study, and faculty members in other departments of the University offer strong interdisciplinary support.

The Graduate School of the University offers two degrees in Religious Studies, the Master of Arts and the Doctor of Philosophy. All students enter at the master’s level and, upon successful completion of those requirements, may request to proceed to the Ph.D.

The M.A. program introduces students to the general problems and methods in the study of religion. Specific requirements include:
• thirty hours of course credit, including RELI 200 and one "gateway" course;
• two written comprehensive examinations, one in the general field of religion and one in a specialty field;
• a thesis of three to six credits and an oral defense;
• demonstrated competence in French or German.

The doctoral program is primarily intended to prepare students for a career in university and college teaching and research in religious studies. It currently offers specialization in American Religions, Ancient Mediterranean Religions, History of Religions, Medieval and Early Modern Studies, and Religion and Culture.

Ph.D. students should expect to take at least eighteen hours course work beyond the M.A. level. Other requirements in the doctoral program include:
• completion of requirements in one of the specialty fields noted above;
• written and oral qualifying examinations specific to the field of specialization;
• demonstrated reading competence in French and German;
• a dissertation and oral defense.

For further information, please write to the Director of Graduate Studies, Department of Religious Studies, CB# 3225, 101 Saunders Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3225; e-mail: religion@unc.edu. Please also see the department Web page at www.unc.edu/depts/rel_stud.

Courses for Graduates and Advanced Undergraduates

106 MEDIEVAL CHURCH (History 100) (3). The nature and workings of the Western church between roughly 600 and 1300. Emphasis on the church "from within": organization, missionary strategies, liturgy, monasticism, popular religion. Spring. Alternate years. Pfaff.

107 TOPICS IN PHILOSOPHICAL PROBLEMS IN RELIGION (3). Prerequisite, senior or graduate standing, or permission of the instructor. The problem of intention, or knowledge of other minds, and the study of alien cultures are central issues. Spring. Tyson, Stivers.

110 JOSEPH - KING OF DREAMS; JOSEPH IN BIBLE AND TRADITION (3). A study of the Joseph story as preserved in Genesis 37-50 and interpretative history in Early Judaism. Lange.

112 BIBLICAL COPTIC AND EARLY EGYPTIAN MONASTICISM (3). Prerequisite, permission of instructor. Coptic, the last stage of Egyptian, a living language in the Roman and Byzantine Period. Thorough grounding in grammar of the Sahidic dialect as a basis for reading biblical, monastic, and gnostic texts. Fall. Spring. Faculty.

113 BIBLICAL HEBREW (3). Fall. Staff.

114 BIBLICAL HEBREW (3). Spring. Staff. Prerequisite, RELI 113.

115 INTERMEDIATE CLASSICAL HEBREW (3). Prerequisite, 114 or permission of the instructor. Reading in biblical, Mishnaic, and medieval poetry and prose. Fall. Staff.

116 INTERMEDIATE CLASSICAL HEBREW (3). Prerequisite, 115 or permission of the instructor. Continuation of Religious Studies 115. Spring. Staff.

119 GREEK NEW TESTAMENT (Greek 158) (3). Prerequisite, Greek 21 or equivalent. (On demand.) Stadter.

120 RELIGION, FUNDAMENTALISM, AND NATIONALISM (PWAD 120) (3). An exploration of explosive combinations of religion and politics in the Iranian revolution, the Palestinian movement, Hindu nationalism in India, and Christian fundamentalism in America. Spring. Ernst.

121 MYTHS AND EPICS OF THE ANCIENT NEAR EAST (Folklore 141) (3). Prerequisite, permission of the instructor. An examination of Babylonian, Canaanite, Egyptian, Hittite, and Sumerian texts from the pre-biblical era, focusing on representative myths, epics, sagas, songs, proverbs, prophecies, and hymns. Spring. (Alternate years.) Staff.

122 EXPLORING THE DEAD SEA SCROLLS (3). A comprehensive introduction to the Dead Sea Scrolls and the different Jewish groups connected with them. Lange.


125 MOSES, THE MAN AND THE TRADITION (3). Prerequisite, Religious Studies 21. The course studies the formation of the biblical traditions about Moses in Egypt, the exodus, and the giving of the law at Sinai. (On demand.) Staff.

126 WHAT ARE HOLY SCRIPTURES? THE FORMATION OF THE HEBREW CANON (3). The course traces the canonical process which led to the Hebrew Bible and the Greek Old Testament. Lange.

127 PROBLEMS IN EARLY CHRISTIAN LITERATURE AND HISTORY (3). Prerequisite, one of the following: Religious Studies 22, 58, or 59, or permission of the instructor. Fall. Ehrman.


129 DEATH AND AFTERLIFE IN THE ANCIENT WORLD (3). Prerequisites, RELI 21, 22, 24, 27, 61 or permission of instructor. Examination of practices and discourses pertaining to death and the afterlife in ancient civilizations of the Near East, Greece, and Rome. Spring. Plese.

130 RELIGION, NATURE, AND ENVIRONMENT (Anthropology 138) (3). A seminar on concepts of nature within religions and a variety of world-wide spiritual traditions. Emphasis on sacred space, place, and pilgrimage as a vital intersection of religion and nature.

132 TOPICS IN MEDIEVAL PHILOSOPHY (Philosophy 152) (3). Consult Philosophy Department. Spring. Galligan.


136 STUDIES IN CHRISTIAN THEOLOGIES AND THEOLOGIANS (3). Prerequisite, permission of the instructor. An investigation of one writer or school in the history of Christian theology as an example of typical methods, positions, and problems within that tradition. Fall or spring. Kaufman, Lazar.

137 THE ART OF DEVOTION IN MEDIEVAL AND EARLY MODERN EUROPE (3). Prerequisite, one of the following: Religious Studies 27, 30, or permission of instructor. Examines creative expression at religious services from 1000 to 1700. Poetry, drama, art, architecture, and music will be studied to understand the religious culture of this rich period. Lazar.

138 MODERN WESTERN RELIGIOUS THOUGHT (3). Prerequisite, one of the following: Religious Studies 27, 29, 30, 32, 35, or Philosophy 32. Representative themes and approaches in the work of modern Western religious thinkers. Spring. Peck, Kaufman, Stivers.

140 STUDIES IN AMERICAN RELIGION (3). Prerequisite, permission of the instructor. A consideration of varying topics from the intellectual, literary, social, and cultural dimensions of American religion. Fall or spring. Ariel, Maiffy-Kipp, Tweed.

142 RELIGION AND ANTHROPOLOGY (Anthropology 142, Folklore 142) (3). Prerequisite, junior/senior or graduate standing. Religion, studied anthropologi-
144 MEDIEVAL SLAVIC CULTURE (Slavic Languages 144). (3). Survey of medieval Slavic culture, beginning with Christianization in the ninth and tenth centuries. Themes include Byzantine missions, the replacement of paganism with Christianity, the oral tradition, and Slavic literary relations. Readings in English for non-Slavic concentrators. Putney.

146 RELIGION, MAGIC, AND SCIENCE (3). Critical exploration of the ways in which religion, magic, and science have been constructed as distinct domains of knowledge in the West since the late nineteenth century. Fall or spring. Saunders, Syers.

148 HISTORY OF RELIGION IN AMERICA TO 1865 (3). An examination of primary sources in the history of American religion from the precolonial era to the Civil War. Fall. Ariel, Maffly-Kipp, Tweed.


150 RELIGIONS OF AFRICA (3). Prerequisite. Religious Studies 10 or equivalent. A general study of religious forms in Africa. Fall or spring. Staff.

152 MORMONISM AND THE AMERICAN EXPERIENCE (3). Prerequisite. RELI 29 or permission of instructor. Exploration of the history, beliefs, and practices of Mormons. Will include visits to Latter-day Saints services, guest speakers, and discussion of race and gender in the contemporary church. Fall, spring. Maffly-Kipp.

153 EVANGELICALISM IN CONTEMPORARY AMERICA (3). Prerequisite. junior or senior standing. Examination of Evangelicalism and its role in American society, politics, and culture. Exploration of its various subdivisions and its relation to such movements as Fundamentalism, Pentecostalism, Revivalism and Pentecostalism. Spring. Ariel.

155 THE AMERICAN ENCOUNTER WITH ASIAN RELIGIONS (3). A study of intercultural interaction and interreligious encounter focusing on Asian religions in America, 1784 to the present. Fall. spring. Tweed.

156 ETHNICITY, RACE, AND RELIGION IN AMERICA (3). Prerequisite. Religious Studies 29 or permission. A methodological inquiry into ethnicity, race, and religion as constituents of personal and communal identity. Emphasis on the implications of these categories for a religiously pluralistic society. Fall, spring. Maffly-Kipp.

157 HINDU-MUSLIM INTERACTION IN SOUTH ASIA (3). Study of the religious categories “Hindu” and “Muslim,” and various theories of their cross-cultural interaction, in selected cases in premodern South Asia. Fall. Ernst.

158 THE RESHAPING OF AMERICAN RELIGION SINCE 1960 (3). Course examines developments in American religion since the 1960s, exploring new modes of religious life in America as well as the reshaping of the general religious scene. Fall. Ariel.


160 TOPICS IN COMPARATIVE RELIGION (3). Cross-cultural investigation of specific problems or issues in the general history of religions (e.g., pilgrimage, religious biography, “new” religions). (On demand.) Sanford, Waghorne.

161 SELECTED TOPICS IN THE STUDY OF ASIAN RELIGIONS (3). Prerequisite. permission of the instructor. A close examination of a selected topic in Asian religions. Fall. Sanford.

162 TAOISM (3). A study of the major writings and cultic forms of Taoism. Some attention is also given to related unorthodox, popular movements. Fall or spring. Sanford.

163 RELIGIOUS DIMENSIONS OF JAPANESE CULTURE (3). The role of Shinto and Buddhism in the development of Japanese art and literature. Fall. Sanford.

169 MEDIEVAL RELIGIOUS TEXTS (3). Prerequisites, permission of the instructor and reading knowledge of Latin. Readings in one or two major texts in Latin which permit close study of several issues in the development of Christian life and thought during the Middle Ages. Spring. Kaufman.

171 SUFISM (3). Prerequisite, permission of the instructor. A survey of Islamic mysticism, its sources in the Qu’ran and the Prophet Muhammad, and its literary, cultural, and social deployment in Arab, Persian, Indic, and Turkish regions. Fall. Ernst.

172 ISLAM IN SOUTH ASIA (3). A survey of the formation of Islamic traditions in the subcontinent from the eighth century to the present, with emphasis on religion and politics, the role of Sufism, types of popular religion, and questions of Islamic identity. Spring. Ernst.

174 CHINESE WORLD VIEWS (Anthropology 174) (3). An approach to Chinese history, literature, science, and society through an exploration of a few pervasive cultural themes. Chinese sources in translation and Western anthropological and philosophical sources are used. Fall or spring. Farquhar.

175 RELIGION AND CULTURE IN MODERN SOUTH ASIA (3). Study of Buddhism, Islam, and Hinduism in the development of contemporary Sri Lanka, Pakistan, and India, respectively. Focus on the roots of change in the late nineteenth century and the problems of modernization. (On demand.) Staff.

178 GENDER IN THE HISTORY OF RELIGIONS (3). Developments in the use of gender as a religious symbol and a religious structure from primal religion to the beginning of the philosophical traditions in Asia, Africa, and Europe. Fall or spring. Waghorne.

179 READINGS IN ISLAMICATE LITERATURES (3). Prerequisite, permission of the instructor. Study of selected religious, literary, and historical texts in Arabic, Persian, or Urdu. (On demand.) Ernst.

184 STUDIES IN THE PSYCHOLOGY OF RELIGION (3). Prerequisite. Religious Studies 36, 84, or permission of the instructor. The interpretation of myths, dreams, and rituals using the resources of depth psychology and the tools of cultural criticism. Fall or spring. Peck.

185 SHAMANISM, FEMINISM, AND COLONIALISM (3). Shamanism, feminism, and colonialism as significant forces in Latin American religious history and cultural life. Fall. Peck.

186 NINETEENTH-CENTURY CRITIQUES OF RELIGION (3). Prerequisite, permission of the instructor. An exploration of influential nineteenth-century critiques of religion, including texts by such thinkers as Feuerbach, Marx, Kierkegaard, Nietzsche, Stanton, Douglass, and Freud. Fall or spring. Syers.

187 RITUALS AND RHETORICS OF RELIGION (3). Prerequisite, permission of the instructor. Examination of ritual, allegory, and symbol as modes of religious expression in cultic and literary contexts. Fall or spring. Tyson.

188 RELIGION IN AMERICAN LAW (3). Prerequisite, junior, senior, or graduate standing. An exploration of the position of religion in American legal and social theory, with particular focus on jurisprudence under the First Amendment. Fall or spring. Syers.

190 RELIGION AND SOCIETY (Sociology 121) (3). Prerequisite. Sociology 10 or permission of the instructor. Sociological analysis of group beliefs and practices—both traditionally religious and secular—through which fundamental life experiences are given coherence and meaning. Fall or spring. Powell, Reed.

191 RELIGIOUS ETHICS AND ISSUES IN CONTEMPORARY MEDICINE (3). Prerequisite, senior or graduate standing. Examination of religious-ethical dimensions of such issues as the dying patient, organ transplants, abortion, prolongation of life, and experimentation on human beings, drawing on theory from the traditional Western religious and the social sciences. Fall or spring. Staff.
192 CONTEMPORARY HINDUISM IN A GLOBAL CONTEXT (3). Seminar on changes in Hinduism in contemporary urban India and among the "diaspora" that migrated to the United States and United Kingdom. Discussion of the transmission of Hinduism in this global context. Spring. Waggoner.

193 SPECIAL TOPICS IN MYSTICISM (3). Prerequisite, permission of the instructor. Historical and typological study of specific aspects of mystical and non-normative religious forms. Fall or spring. Sanford.

199 INDEPENDENT STUDY (3). Prerequisites, advanced undergraduate or graduate standing and permission of the instructor. Subject matter varies with instructor and topic but always focuses on a particular problem or issue. Fall and spring. Staff.

200 PRO-SEMINAR IN RELIGIOUS STUDIES (3). Prerequisite, graduate standing in Religious Studies or permission of the instructor. A basic problems and methods course required of all graduate students in Religious Studies. Spring. Staff.

201 TEACHING WORLD RELIGIONS IN A MULTICULTURAL CONTEXT (3). Prerequisite, graduate standing in Religious Studies or permission of the instructor. Seminar on the problems of teaching cross-cultural and cross-disciplinary courses in world religions in undergraduate curriculum. Discussion of the place and purpose of religious studies courses in a multicultural context. Fall. Waggoner.

202 APPROACHES TO THE STUDY OF AMERICAN RELIGIONS (3). Prerequisite, graduate standing in Religious Studies or permission of the instructor. Consideration of methods, theories, and interpretations that have been influential in the study of American religion. Fall, spring. Tweed.

203 THEMES IN AFRICAN AMERICAN RELIGIOUS HISTORY (3). Prerequisite, graduate standing in Religious Studies or permission of the instructor. A historical and thematic survey of the religious experiences of African Americans from the pre-colonial era to the present. Fall, spring. Maffly-Kipp.

204 RELIGION AND LITERATURE IN AMERICA (3). Prerequisite, graduate standing in Religious Studies or permission of the instructor. A study of the religious tradition in American literature from the Puritan period to the present. Staff.

205 CURRENT TRENDS IN AMERICAN JUDAISM (3). The course aims at examining the current developments in American Judaism: cultural, spiritual, liturgical, as well as social and institutional. Spring. Ariel.

207 APPROACHES TO MEDIEVAL AND EARLY MODERN STUDIES (3). Prerequisite, graduate standing in Religious Studies or approval of instructor. An introduction to the problems and methods in the study of medieval and early modern religion in the West. Fall. Kaufman, Lazar.


222 UGARITIC (3). Prerequisites, Religious Studies 115-116. Readings in the alphabetic texts of Ras Shamra and a study of the elements of Ugaritic grammar. Staff.

223 READINGS IN EARLY JEWISH AND CHRISTIAN APOCALYPTIC (3). Prerequisite, permission of the instructor. Readings from apocalyptic texts in the original languages. Spring. Staff.

224 ARAMAIC/RABBINIC HEBREW (3). Prerequisites, Religious Studies 115-116 or permission of the instructor. Reading texts in rabbinc Hebrew, or in Biblical and/or Talmudic Aramaic, with appropriate grammatical instruction. Fall. Staff.

225 HISTORY-WRITING IN ANCIENT ISRAEL (3). A study of the historical tradition in the Old Testament (Genesis to 2 Kings), to include a comparison with historiography of ancient Greece and the Near East. (On demand.) Staff.

226 READINGS IN GRECO-ROMAN RELIGION (3). Prerequisite, permission of the instructor. Opportunity for reading of ancient documents representing the more important religious trends of the Greco-Roman world. Ehman.

227 EARLY CHRISTIAN HISTORY AND LITERATURE (3). Prerequisite, permission of the instructor. A critical study of the history and literature of early Christianity from Paul to Irenaeus with texts to be read in the original language. Ehman.

228 DOCUMENTS IN EARLY JEWISH AND CHRISTIAN EXEGESIS (3). Prerequisite, graduate standing in Religious Studies or permission of the instructor. A comparative study of the interpretation of the Hebrew Scriptures in rabbinic Judaism and in early Christianity; texts to be read in the original languages. Staff.


240 CRITICAL APPROACHES TO RELIGION AND CULTURE (3). Prerequisite, graduate standing in Religious Studies, or permission of the instructor. Exploration of various forms of contemporary critical thought (including gender theory, critical race theory, and post-colonial studies) in order to assess the value of these critical tools for the study of religion. Spring. Syers.

244 CRITICAL AND COMPARATIVE LINEAGES IN RELIGION AND CULTURE (3). Exploration of intellectual lineages shaping the contemporary study of religion and culture. Fall. Tyson, Saunders, Syers.

245 STUDIES IN THE RHETORIC OF IMAGES (3). Prerequisite, permission of the instructor. Selected readings on image production, exhibition, and interpretation, with consideration of different ritual and cultic settings. Spring. Saunders.

246 CRITICAL WORKS IN RELIGION AND LITERATURE (3). Prerequisite, permission of the instructor. Textual analysis of several theoretical and literary works dealing with selected problems in religion and literature. Staff.

247 THEORIES OF RELIGION AND CULTURE (3). Prerequisite, permission of the instructor. Studies in early modern, enlightenment and romantic political, philosophical, and literary texts. Saunders, Syers.

248 READINGS IN AMERICAN RELIGION TO 1865 (3). An examination of primary sources in the history of American Religion from the pre-colonial era to the Civil War. Fall. Ariel, Maffly-Kipp, Tweed.


263 EARLY JEWISH HISTORY AND LITERATURE (3). Prerequisite, permission of the instructor. An examination of the main varieties of pre-rabbinic Judaism: Hellenistic Judaism, apocalyptic Judaism, and the Judaism of the Dead Sea Scrolls. Staff.

264 PROBLEMS IN RABBINIC HISTORIOGRAPHY (3). Prerequisite, Religious Studies 263 or permission of the instructor. Examination of the methodological problems of using rabbinc materials as sources for the history of Judaism in the period after 70 CE. Spring. Staff.

266 READINGS IN RELIGIONS OF THE ANCIENT NEAR EAST (3). Focusing on the Mediterranean religions before Alexander, readings of original documents in translation, illustrating theology and cult, as well as major history of religions interpretations. Spring. Staff.

268 THE APOSTOLIC FATHERS (3). Prerequisites, Greek and permission of the instructor. A study of selected works of the Apostolic Fathers, including Barnabas, Ignatius, and Polycarp. Fall. Ehman.

269 MEDIEVAL RELIGIOUS TEXTS (3). Prerequisite, permission of the instructor. Selected texts which illumine significant aspects of medieval religious culture are read in the original languages. Kaufman.

270 TEXTS OF THE CATHOLIC AND PROTESTANT REFORMATIONS (3). Prerequisite, permission of the instructor. Selected texts which illumine significant aspects of the Catholic and Protestant Reformation are read in the original languages. Kaufman, Lazar.
275 TEXTUAL CRITICISM OF THE GREEK BIBLE (3). Prerequisite, Greek and permission of the instructor. Reconstruction; application of text-critical principles. Spring; Ehrman.

279 READINGS IN ISLAMICATE LITERATURE (3). Prerequisite, permission of instructor. Study of selected religious, literary, and historical texts in Arabic, Persian, or Urdu. May be repeated for credit. Staff.

284 THEORIES OF RELIGIOUS EXPERIENCE (3). Prerequisite, graduate status. An investigation of the psychology of religion from such figures as Kierkegaard, Nietzsche, Freud, Jonathan Edwards, and William James. Fall or spring; Peck.

288 OBSERVATION AND INTERPRETATION OF RELIGIOUS ACTION (3). Prerequisite, permission of the instructor. Exercises in learning to read the primary modes of public action in religious traditions: sermons, testimonies, rituals, prayers, etc. Primary focus on construction and interpretation of texts from field observation. Tyson.

293 COMPARATIVE MYSTICISM (3). Critical and comparative approaches to the category of mysticism, with emphasis on Islamic, Christian, and Hindu examples and problems of cross-cultural transmission. Spring; Staff.

299 TOPICS IN THE STUDY OF RELIGION (3). Prerequisite, graduate standing in Religious Studies or permission of the instructor. Topics vary. Spring; Staff.

300 SEMINAR IN COMPARATIVE AND HISTORICAL STUDIES (3). Topics vary; consult department. Fall or spring; Sanford, Kaufman, Peck.

302 READINGS IN TALMUD (3). Prerequisite, permission of the instructor. An introduction to the study of the Babylonian Talmud in the original Hebrew and Aramaic, with the traditional commentaries. The emphasis is on understanding Talmudic logic. Staff.

303 SEMINAR IN AMERICAN RELIGION (3). Topics vary. May be repeated for credit. Fall, spring; Maffly-Kipp, Tweed.

304 RELIGION AND SOCIAL ISSUES IN AMERICA (3). Prerequisite, RELI 202 or 203. Historical analysis of the relationship between religious developments and social issues in America. Topics may include economics, politics, social reform. Maffly-Kipp.

305 SEMINAR IN BIBLICAL STUDIES (3). Topics vary; consult department. Ehrman.

306 HELLENISTIC RELIGIOUS TEXTS IN GREEK (3). Studies in Greek texts drawn from early Christianity, Judaism, and other religions of the Greco-Roman World. Ehrman.

307 THE GNOSTIC SCRIPTURES (3). Prerequisite, RELI 112 or permission of instructor. Close reading and interpretation of ancient gnostic texts found near Nas Hammad near in Egypt. Spring; Plese.

308 METHODS AND TOPICS IN THE MEANS OF WESTERN RELIGIOUS TRADITIONS (3). Prerequisite, permission of the instructor. Exploration of one enduring issue in the history of the Western Christian traditions. The instructor selects several case studies that illustrate both the topic and the development within traditions. Lazar, staff.

309 POST-COLONIAL APPROACHES TO THE STUDY OF RELIGION (3). Prerequisite, permission of the instructor. An examination of major themes in contemporary post-colonial thought, and the application of this work to the study of religion. Syers.

310 SEMINAR IN RELIGION AND CULTURE (3). Prerequisite, permission of the instructor. Topics vary; consult department. Peck, Tyson, Maussawa, Saunders, Syers.

311 SEMINAR IN RELIGION AND LITERATURE (3). Prerequisite, permission of the instructor. Topics vary. Saunders.

312 RELIGION AND CULTURAL CONTACT IN AMERICA (3). Examination of religion in America through instances of intercultural contact. Topics vary. Fall, spring; Maffly-Kipp.

314 THE CHRISTIAN-JEWISH ENCOUNTER IN AMERICA (3). Course examines the Christian-Jewish encounter in America from the seventeenth century to the present. Analyzes both theological and social interactions. Fall; Ariel.

315 SPACE, PLACE, AND RELIGION (3). Interdisciplinary graduate seminar focuses on religion, space, and place in the United States. Fall or spring; Tweed.

325 READINGS AND RESEARCH (3). Prerequisite, permission of the instructor. Fall and spring; Staff.

393 MASTER'S THESIS (3 or more). Fall and spring; Staff.

394 DOCTORAL DISSERTATION (variable). Fall and spring; Staff.

DEPARTMENT OF ROMANCE LANGUAGES

FRANK DOMINGUEZ, Chair

Professors
French
1. R. Strickling Haig (6) Nineteenth-Century French Literature
Catherine A. Malley (111) Romance Linguistics
G. Mallory Masters (8) French Renaissance
James S. Noblit, Applied Linguistics and Language Learning
Carol Lynn Sherman (12) Eighteenth-Century French Literature and Literary Theory
Frederick Wright Vogler (7) Seventeenth-Century French Literature
Italian
Dino Cervigni (44) Medieval and Renaissance Italian Literature
Antonio Illiano (14) Modern Italian Literature
Portuguese
Fred M. Clark (29) Portuguese Language and Brazilian Literature
Monica P. Recco (43) Portuguese Language and Literature
Spanish
Pablo Gil Casado (23) Contemporary Spanish Literature, Theory of the Novel
Frank A. Dominguez (25) Medieval and Golden Age Literature, Ideology and Literature, Computer Applications in the Humanities
Audrey Heinig-Boynton, Foreign Language Pedagogy, Curriculum Instruction
Larry D. King (36) Spanish and Romance Linguistics, Semantics and Pragmatics
Maria A. Salgado (24) Contemporary Spanish American and Spanish Literature, Literary Self-Portrait, Poetry at the Fin de Siete

Associate Professors
French
Martine A. Ansel (45) Twentieth-Century French Literature
Yves de la Queffière (10) French Stylistics and Twentieth-Century French Literature
Dominique Fisher (46) Nineteenth-Century French Literature
Edward D. Montgomery (9) Romance Philology
Italian
Ennio Rao (15) Italian Renaissance
Spanish
Lucia Binotti (47) Medieval, Renaissance, Golden Age Philology and Linguistic Thought
Martha S. Collins (42) Modern Peninsular Literature
Rosa Peralta (57) Colonial Spanish American Literature, Contemporary Spanish American Narrative
José Manuel Pardo de Bernabé (34) Nineteenth- and Twentieth-Century Spanish Drama and Poetry, Modern Critical Theory and Film
Alicia Rivera (38) Contemporary Spanish American Literature, Modern Critical Theory, Gender Issues, Literature and Science, Intellectual History
**Assistant Professors**

Spanish  
Stuart A. Day (57) Contemporary Spanish American Literature, Mexican Political Theater  
Olfa Ferrán (58) Contemporary Spanish Literature, Literary Theory, Women's Writing

**Professors Emeriti**  
César R. Castaneda  
Angel L. Gilveti  
Julián Cortés  
Alva V. Ebersole  
Anthony G. Lo Ré

**Requirements for Advanced Degrees**

The degree of Master of Arts is offered with concentration in French, Italian, Portuguese (Luso-Brazilian), or Hispanic literature. The program for the M.A. degree is open to students holding the bachelor of arts degree or the equivalent, and whose major field of undergraduate study was normally a Romance language and literature. Students are expected to have proficiency in the Romance language and in English upon admission to the program.

The degree of Doctor of Philosophy is offered with concentration in Romance Languages and Literatures; Romance Philology; French, Italian, Portuguese (Luso-Brazilian), Spanish American, or Spanish Languages and Literatures.

Teaching experience is an essential part of professional training. Therefore, teaching assistance or lecture instruction equivalent to at least three contact hours a week for two semesters, or until teaching competence is acquired, is required of all doctoral candidates.

**Research Facilities**

The Davis Library's Spanish, French, Portuguese, and Italian collections rank in the top twenty in the nation. Romance Philology is supported by the medieval and Renaissance collections in the traditional languages and by significant holdings in Provençal, Catalan, Galician, Romansch, and Rumanian. The Spanish and Spanish American collections are particularly strong in medieval, Golden Age/Colonial, nineteenth-, and twentieth-century holdings. The French collection has similar strengths in the seventeenth, eighteenth, and nineteenth centuries and is enriched by the Charles Nordier and René Char materials. The Italian collection exhibits strength in the nineteenth century and the Portuguese collection in twentieth-century Brazilian. These strengths are enhanced by extensive holdings in reference, specialized journals, and rare books. Among the latter are a notable gathering of twentieth-century first editions of French writers, a distinguished Spanish drama collection of over 26,000 plays (many of them pre-1830 sueltas), and the Platow Collection of Latin American Cronistas, consisting of early imprints of the discovery and conquest of the New World. A more complete description of the collections is available in the “Resources” section of the department's homepage at www.unc.edu/depts/roml.

**CATALAN**

Courses for Graduates and Advanced Undergraduates

101 INTRODUCTION TO CATALAN (3). Introduction to the Catalan language. Readings. Fall or spring. Staff.

**FRENCH**

Courses for Graduates and Advanced Undergraduates

101X, 102X ELEMENTARY FRENCH FOR GRADUATE STUDENTS (3). These courses prepare the student to meet the reading knowledge requirement for graduate degrees. Passing the examination at the end of 102X certifies that this requirement has been satisfied. Three hours a week. Fall and spring. Staff.


126 HISTORY OF THE FRENCH LANGUAGE (LING 164) (3). Prerequisite, French 50 or instructor's permission. Beginning with the Latin foundation, the phonology, morphology and syntax of French are traced from the ninth century to the present through lectures, readings, discussions and textual analysis. Spring. (Alternate years) Maley.

145 FRENCH PHONETICS (LING 165) (3). Prerequisite, French 50 or equivalent, or permission of the instructor. The study of the sound system in modern standard French. Lecture, discussion, laboratory practice in practical phonetics according to individual needs. Spring. Maley.

146 STRUCTURE OF FRENCH (LING 166) (3). Prerequisite, French 50 or equivalent, or permission of the instructor. Introduction to phonology, morphology, and syntax of modern standard French and to theories of modern grammar. Attention is also given to the application of linguistic theory to the teaching of French. Fall. Maley.

Courses for Graduates

211 FRENCH NOVELISTS OF THE TWENTIETH CENTURY (3). Evolution of the novel in France up to the nineties. Spring. Antel, de la Quérière.

212 FRENCH POETS OF THE TWENTIETH CENTURY (3). A study of the poetry of Claudel, Cocteau, the major Surrealists, Ponge, Michaux. Spring. (Alternate years) de la Quérière.

213 MASTERS OF TWENTIETH-CENTURY LITERATURE (3). Studies of a single author, a literary or an aesthetic movement from the Avant-garde to Postmodernism. Fall. Antel, de la Quérière.

214 FRENCH DRAMA OF THE TWENTIETH CENTURY (3). Semiotic readings in French and Francophone theater at the crossroads of cultures from the Avant-garde to Postmodernism.


216 READINGS IN CULTURAL STUDIES (3). An examination of national and transnational identity within European culture and recent economic and ethnologic changes in Western Europe and France. Fall (Alternate years) Antel, Fisher.

221 OLD FRENCH (3). An introductory course designed to enable students to read medieval texts with rapidity and accuracy. Phonology, morphology, semantics, and syntax. Fall. Montgomery.

222 FRENCH STUDIES OF THE ELEVENTH THROUGH THE THIRTEENTH CENTURIES (3). Readings in a variety of medieval texts in light of contemporary literary theory. Spring. Amer, Montgomery.


234 THE FRENCH CLASSICAL THEATRE (3). Readings in sixteenth- and seventeenth-century French theater, Crébillon Pére, and Voltaire. Selection of texts will be announced by instructor. Fall. Staff.

235 DEVELOPMENTS IN POSTCLASSICAL FRENCH DRAMA (3). A study of the genre from Marivaux to the end of the nineteenth century. Fall. (Alternate years.) Sherman.


246 FRENCH LITERATURE OF THE FOURTEENTH AND FIFTEENTH CENTURIES (3). A study of literary trends with emphasis on the rise of the prose narrative and lyric poetry from Machaut through Villon. Spring. (Alternate years.) Montgomery.

251 STUDIES IN FRENCH RENAISSANCE (3). Interdisciplinary seminar on a cultural topic or a theme through readings in literary and non-literary texts. Masters.


272 FRENCH POETRY OF THE SEVENTEENTH CENTURY (3). French poetry from Desportes through Racan emphasizing poésie précieuse et galante, religieuse, pastorale, officelle, libertine, and satirique. In addition to Desportes and Racan, works of Chassaigne, Sponde, La Cepède, Maleherbe, Saint-Amant, Thouophile de Viau, Maynard, and Régnier are considered. Spring. (Alternate years.) Vogler.

274 THE MORALISTS (3). A study of the works of Pascal, La Rochefoucauld, Bossuet, La Bruyère, and La Fontaine. Spring. (Alternate years.) Vogler.

281 MASTERS OF EIGHTEENTH-CENTURY PROSE FICTION (3). An array of novelists and contes such as Prébois, Lesage, Marivaux, Lachaise, Crébillon fils, Montesquieu, Diderot, Rousseau, and others. Spring. (Alternate years.) Sherman.


284 THE "PHILOSOPHES" (3). Intellectual currents (religious, scientific, epistemological) and morals as reflected in such writers as Bayle, la Mettrire, Condillac, Helvétius, d’Holbach, the Encyclopédistes, and others. (On demand.) Sherman.


293 MASTERS OF NINETEENTH-CENTURY FRENCH LITERATURE (3). Intensive study of a single major author of the Romantic or Post-Romantic period. The subject changes from year to year among writers in the different literary genres. Fall. (Alternate years.) Fisher, Haig.


295 THE FRENCH REALISTIC AND NATURALISTIC NOVEL (3). A study of major Realistic and Naturalistic novelists (Flaubert, the Goncourts, Daudet, Zola, Maupassant, and Hamsun). Fall. (Alternate years.) Haig.

296 FRENCH BRIEF FICTION OF THE NINETEENTH CENTURY AND/OR TWENTIETH CENTURY (3). A study of short narrative as a hybrid genre from a literary and cultural perspective, de la Quétitude, Fisher.

330 SEMINAR (3). Staff.

331 THE HISTORY OF FRENCH LITERATURE BEFORE 1300 (3). (On demand.) Montgomery.

340 SPECIAL READINGS (Var.). Members of the graduate faculty. (Doctoral students only.)

393 MASTER’S THESIS (3). Members of the graduate faculty.

394 DOCTORAL DISSERTATION (3). Research in a special field under the direction of a member of the graduate faculty.

ITALIAN

Courses for Graduates and Advanced Undergraduates

101X, 102X ELEMENTARY ITALIAN FOR GRADUATE STUDENTS (3).
These courses prepare the student to meet the reading knowledge requirement for graduate degrees. Passing the examination at the end of 102X certifies that this requirement has been satisfied. (On demand.) Staff.

103 ADVANCED COMPOSITION FOR GRADUATE STUDENTS (3).
Review of advanced grammar. Composition on a variety of topics designed to enhance writing proficiency in Italian. Training in the use of stylistic devices. Fall. (Alternate years.) Cervigni, Illiano, Rao.

111 SURVEY OF ITALIAN LITERATURE I (to 1600) (3). Prerequisite, permission of the instructor for undergraduates; none for graduate students. Survey conducted as comprehensively as feasible on the basis of available anthologies in the original language, with particular attention to authors and texts included in the current departmental reading lists. (On demand.) Staff.

112 SURVEY OF ITALIAN LITERATURE II (1600 to present) (3). Prerequisite, permission of the instructor for undergraduates; none for graduate students. See description under Italian 111. (On demand.) Staff.

126 HISTORY OF THE ITALIAN LANGUAGE (3). Prerequisites, Italian 15 or 21 and consent of instructor. The evolution of the Italian language as documented in literary texts from the origins to the present. Spring. (Alternate years.) Rao.

134 PETRARCH AND LYRIC TRADITION (3). A reading of Petrarch’s Canzoniere within the context of previous lyric traditions and Petrarchism in Europe. Class discussion in English; readings in Italian for majors and in translation for non-majors. (Every third year.) Cervigni.

135 BOCCACCIO AND EUROPEAN NARRATIVE (3). Boccaccio’s Decameron within the context of previous narrative traditions and subsequent development of narrative in Europe. Class discussions in English; readings in Italian for majors and in translation for non-majors. (Every third year.) Cervigni.

141 ITALIAN LITERATURE OF THE RENAISSANCE I (3). Prerequisite, Italian 15 or 21 or equivalent. A study of the major figures of Italian Humanism, Latin and vernacular, from Salutati to Poliziano. Fall. (Alternate years.) Rao.

151 ITALIAN LITERATURE OF THE RENAISSANCE II: THE CINQUECENTO (3). Prerequisite, Italian 15 or 21 or equivalent. After a brief description of
the literary situation in the Cinquecento, the following three authors are studied in
detail, with close reading of the three works indicated: Machiavelli, Il Principe and
at least one book of Dom Quixote; Ariosto, Orlando Furioso; Tasso, Gerusalemme

171 THE SEVENTEENTH AND EIGHTEENTH CENTURIES (3).
Prerequisite, Italian 15 or 21. The age of Baroque, Campanella, the new genres,
Tassoni. The literature of Arcadia, the Enlightenment, Goldeni, Parini, and Alberi.
Fall. (Alternate years.) Illiano.

181 ITALIAN ROMANTICISM (3). Prerequisite, Italian 15 or 21.
Romanticism; Alberi: the lyrics and novels of Foscolo, Leopardi, Manzoni; the
Romantic drama from Pindemonte to Niccolini. Spring. (Every third year.) Illiano.

182 ITALIAN LITERATURE IN THE SECOND HALF OF THE NINE-
TEENTH CENTURY (3). Prerequisite, Italian 51, 21, or equivalent. The major liter-
ary forms in the second half of the century with particular regard to Verismon, Verga,
Carducci, Pascoli, Scapigliatura, and women writers. Spring. (Every third year.) Illiano.

194 MODERN ITALIAN POETRY (3). Prerequisite, Italian 15 or 21. The major
poets and trends of the late nineteenth and twentieth centuries: Decadent, Crepuscolari,
Futurist, Ermetici, and women poets. Fall. (On demand.) Illiano.

195 MODERN ITALIAN FICTION (3). Prerequisite, Italian 15 or 21. Svevo,
Moravia, Calvino, and women writers. Fall. (On demand.) Illiano.

196 MODERN ITALIAN DRAMA (3). Prerequisite, Italian 15 or 21. Grotteschi,
Pirandello, Italian drama after World War II, Eduardo de Filippo. Spring. (Every third
year.) Illiano.

Courses for Graduates

206 PROSEMINAR (3). Prerequisite, graduate standing. An introduction to mod-
ern Italian criticism and to current methods of research and scholarship.
Bibliographic survey of basic tools and secondary literature. Guidance to prepa-
ratio of papers, theses, and dissertations. (On demand.) Illiano.

221 OLD ITALIAN (3). An introduction to the historical development of Old
Italian, Sardinian, and Dalmatian. Survey of major dialectal areas. Fall. (Every third
year.) Montgomery.

222 HISTORICAL ITALIAN GRAMMAR (3). The development from Latin to
Italian linguistic structures. (On demand.) Montgomery.

231 DANTE I (3). Prerequisite, graduate standing or consent of the instructor.
After a brief general presentation of Dante's life and works, the class studies the
Divina Commedia in the original through the Inferno and the first six Cantos of
Purgatorio. (Alternate years.) Cervigni, Illiano.

232 DANTE II (3). Prerequisite, graduate standing or consent of the instructor.
This semester completes the critical reading of the Divina Commedia starting
Purgatorio. Under satisfactory conditions Dante I will not be a prerequisite for
Dante II. Spring. (Alternate years.) Cervigni, Illiano.

245 THE ITALIAN TRECENTO: PETRARCH AND BOCCACCIO (3). Fall.
(On demand.) Cervigni.

330 SEMINAR (3). Special study and research in set topics, e.g., Seicento and
Baroque: Italian literary Criticism (History of); the Questione della Lingua; drama
through the Renaissance. (On demand.) Staff.

340 SPECIAL READINGS (Var). Members of the graduate faculty.

393 MASTER'S THESIS (3). Members of the graduate faculty.

394 DOCTORAL DISSERTATION (3). Research in a special field under the
direction of a member of the graduate faculty.

PORTUGUESE

Courses for Graduates and Advanced Undergraduates

101 SURVEY OF PORTUGUESE LITERATURE I (3). Prerequisites, Portuguese
4, 15 or equivalent. An introduction to Portuguese literature from its origin
through the eighteenth century. Fall. (Alternate years.) Rector.

102 SURVEY OF PORTUGUESE LITERATURE II (3). Prerequisites,
Portuguese 4, 15, or equivalent. A survey of Portuguese literature of the nineteenth
and twentieth centuries. Spring. (Alternate years.) Rector.

103 SURVEY OF BRAZILIAN LITERATURE I (3). Prerequisites, Portuguese 4,
15, or equivalent. A survey of Brazilian literature of the colonial period and nine-
teenth century. Fall. (Alternate years.) Clark.

104 SURVEY OF BRAZILIAN LITERATURE II (3). Prerequisites, Portuguese 4,
15, or equivalent. A study of major writers of twentieth-century Brazilian literature.
Spring. (Alternate years.) Clark.

126 HISTORY OF THE PORTUGUESE LANGUAGE (3). Prerequisites,
Portuguese 4, 15, or equivalent, or consent of the instructor. Survey of the history of
Portuguese with special stress on the characteristics of Brazilian Portuguese and
the factors underlying them. (On demand.) Rector.

135 BRAZILIAN DRAMA (3). Prerequisites, Portuguese 4, 15, or equivalent, or
consent of instructor. A study of representative Brazilian plays of the twentieth cen-
tury with a review of the development of the theatre in Brazil. Fall. (Alternate
years.) Clark.

Courses for Graduates

203 ADVANCED COMPOSITION FOR GRADUATE STUDENTS (3).
Advanced grammar with exercises in translation from English into Portuguese. Free
composition and training in the use of stylistic devices. (On demand.) Clark, Rector.

206 LUSO-BRAZILIAN BIBLIOGRAPHY AND METHODOLOGY (3). An
introduction to bibliography and methodology in Luso-Brazilian literary and lin-
guistic research. (On demand.) Clark, Rector.

210 THE PORTUGUESE NOVEL (3). A study of prose fiction, particularly from
the nineteenth and twentieth centuries, with special emphasis on Camilo Castelo
Branco, Eça de Queiroz, Aquilino Ribeiro, Ferreira de Castro, and the neo-realists.
Fall. (Alternate years.) Rector.

212 THE BRAZILIAN NOVEL (3). Extensive reading of representative Brazilian
novels from the second half of the nineteenth century to the present. Spring.
(Alternate years.) Clark.

213 MACHADO DE ASSIS (3). A study of the prose fiction, drama, poetry, and
criticism of Machado de Assis, with reference to other major writers of the second
half of the nineteenth century. Spring. (1996 and every third year.) Clark, Rector.

214 MODERN BRAZILIAN SHORT FICTION AND ESSAYS (3). A study of
Brazilian short stories, novellas, and essays of the twentieth century. Spring. (Every
third year.) Clark, Rector.

221 OLD PORTUGUESE (3). A study of Portuguese historical phonology and
morphology with readings from medieval verse and prose. Spring. (Alternate years.)
Rector.

231 CAMÕES (3). The works of Camões (epic, lyric poetry, and drama) are studied
with reference to the contemporary Iberian historical and literary background.
Fall. (Every third year.) Rector.

291 PORTUGUESE OVERSEAS LANGUAGE AND LITERATURE (3). A sur-
vey of the use and characteristics of Portuguese as used in Africa and Asia (especially
Cape Verde creole) and readings from contemporary African authors using
Portuguese. Spring. (On demand.) Staff.
330 SEMINAR IN PORTUGUESE LITERATURE (3). Rector.
333 SEMINAR IN LUSO-BRAZILIAN LINGUISTICS (3). Rector.
335 SEMINAR IN BRAZILIAN LITERATURE (3). Clark, Rector.
340 SPECIAL READINGS (Var.). Member of the graduate faculty.
393 MASTER'S THESIS (3). Member of the graduate faculty.
394 DOCTORAL DISSERTATION (3). Member of the graduate faculty.

ROMANCE

Courses for Graduates and Advanced Undergraduates

104 VIOLENCE AND RELIGION IN LITERATURE FROM EPIC TO NOVEL (PWAD 190) (3). Prerequisite, consent of instructor. A study of the sacred character of epic violence, and its historical decline through a process of religious desacralization associated with the emergence of the modern novel. Spring. Bandera.

170 ROMANCE SOCIOLINGUISTICS (3). Study of language in its social context: language variation, multilingualism, social dialects, the role of culture, language, and sex. Includes individual work on a specific language. Spring. King.

200 THEORIES AND TECHNIQUES OF TEACHING (3). Exploration of theoretical issues in teaching Romance languages with their practical applications, including the integration of technology. (Required of all new graduate instructors.) Fall. Jarasch/Cowell.

201 INTRODUCTION TO MEDIEVAL STUDIES (3). Interdisciplinary course to introduce graduate students to the sources, methods, and approaches of Medieval Studies. Fall. Amer and staff.

205 WORKSHOP ON LITERARY THEORY AND RESEARCH METHODS (1.5). An introduction to contemporary theoretical positions designed to acquaint the student with issues posed by formalism, Marxism, feminism, deconstruction, etc. Brief orientation to Romance bibliography and research methods. (Required of all incoming graduate students in Romance Languages.) Fall. Staff.

220 VULGAR LATIN (3). An investigation of the development of the sermo plebeius from its earliest manifestations to its fragmentation into the Romance vernaculars. Spring. (Alternate years.) Montgomery.

225 PROVENÇAL (3). Linguistic analysis of the langue d'oc and investigation of medieval Provençal literature. Fall. (Alternate years.) Montgomery.

324 ROMANCE PALEOGRAPHY (3). Study of the development of medieval Romance book hands and diplomatics from their origins to the advent of printing with practical exercises. Spring. (Every third year.) Montgomery.

330 SEMINAR IN ROMANCE LANGUAGES (3). Staff.

340 SPECIAL READINGS (Var.). Member of the graduate faculty.

370 MINOR ROMANCE TONGUES (3). Introduction to historical development of Catalan, Rhaeto-Romance, and Rumanian. Readings in period texts. (Every third year.) Montgomery.


102 INTRODUCTION TO ROMANIAN: GRAMMAR, PRONUNCIATION, READING, AND CONVERSATION (3). (On demand.) Staff.

SPANISH

Courses for Graduates and Advanced Undergraduates

101X, 102X ELEMENTARY SPANISH FOR GRADUATE STUDENTS (3). These courses prepare the student to meet the reading knowledge requirement for graduate degrees. Passing the examination at the end of 102X certifies that this requirement has been satisfied. Three hours a week. Fall and spring. Staff.

103 ADVANCED COMPOSITION (3). Prerequisite, Spanish 50. Review of advanced grammar. Compositions on a variety of topics designed to enhance writing proficiency in Spanish. Training in the use of stylistic devices. Staff.

110 THE GENERATION OF 1898 (3). A study of the innovative literary forms and techniques of the Generation of 1898 as seen through representative authors such as Azorín, Baroja, Machado, and Valle-Inclán. Collins.

117 CERVANTES (3). Prerequisites, Spanish 71, 72, or 73. The works of Cervantes, stressing the Quijote and the Novelas ejemplares, with consideration of background of Renaissance prose (the romances of chivalry, pastoral, picaresque novel). Spring. Bandera.

120 THE IMAGE OF WOMAN IN THE SIXTEENTH TO SEVENTEENTH CENTURIES (WMST 120) (3). A study of the inscription of femininity in texts by Spanish and Spanish American authors. Readings are available in Spanish or in English translation. Lectures are conducted in English. Perelmutter.

135 MODERN SPANISH DRAMA (3). Prerequisites, Spanish 71, 72. A study of plays by principal Spanish dramatists of the twentieth century. Fall. (Alternate years.) Polo de Bernabé.


Courses for Graduates

201 BEGINNINGS OF CASTILLAN HEGEMONY TO 1369 (3). Early medieval romance period (eleventh century-1369). The establishment of Castilian hegemony studied through a wide variety of texts (chronicles, miracles, collections of law and exempla, fables, epic and lyric poems.) Fall. Domínguez.

202 THE TRASTAMARA DYNASTY: 1369-1504/16 (3). The final shaping of Castile and the beginnings of nationhood studied through a wide variety of texts (chronicles, books of chivalry, lyric and narrative poems, sentimental novels, travel narratives, etc.). Fall. Domínguez.

207 THE HISPANIC FILM: THEORY/CULTURE/LITERATURE (3). A study of Spanish-American film with special attention to problems of an aesthetic and ideological nature and to the relationships between literature, culture, and film. Spring. Polo de Bernabé.

209 NONFICTION PROSE OF THE SIXTEENTH AND SEVENTEENTH CENTURIES (3). Consideration of the histories, chronicles, didactic works of the Renaissance and the Siglo de Oro, with special emphasis on the literature of exploration. Fall. (Alternate years.) Perelmutter.

210 NINETEENTH-CENTURY SPANISH NOVEL (3). A study of the development of Romanticism, Costumbrismo, Realism, and Naturalism, principally through the novels of Gil y Carrasco, Peceda, Valera, Pérez Galdós, Pardo Bazán, Clarín, and Blasco Ibáñez. Spring. (Alternate years.) Casado.

211 TWENTIETH-CENTURY SPANISH NOVEL (to 1936) (3). A study of major novelists associated with the Generation of 1898, Modernism, the Generation of 1914, and the Generation of 1927; principally Unamuno, Baroja, Valle-Inclán, Mié, Pérez de Ayala, Gómez de la Serna, Chacel, and Sender. Fall. (Alternate years.) Casado.
212 SPANISH CONTEMPORARY NOVEL (3). A study of major novelists from the Spanish Civil War of 1936 to the present time, with emphasis on Ayala, Cela, Garcia Hurtelano, Goytisolo, Bener, and others. Spring. (Alternate years.) Casado.

214 GOLDEN AGE POETRY (3). Major poetic works from Garcilaso through Quevedo. Fall. (Alternate years.) Bandera.

215 SPANISH POETRY AND DRAMA OF THE NINETEENTH AND EARLY TWENTIETH CENTURY (3). Study of Spanish dramatists and poets of the period in context of the nineteenth-century aesthetics and literary movements such as romanticism, postromanticism, symbolism, and modernism. Spring. (Alternate years.) Polo de Bernabé.

216 CONTEMPORARY LYRIC POETRY (3). Major poets from the Generation of 1927 to the present. Spring. (Alternate years.) Polo de Bernabé.

221 OLD SPANISH I (3). Fall. Binotti.

222 OLD SPANISH II (3). Spring. (Alternate years.) Binotti.

225 GOLDEN AGE PROSE (3). The major prose works of the Golden Age, excluding those of Cervantes. Fall. (Alternate years.) Bandera.

233 TOPICS IN GOLDEN AGE LITERATURE (3). A thorough study of a scholarly topic not covered in any other Golden Age course. Representative topics include: the sense of tragedy in the Comedia, Calderón's sacramental plays, and others. Fall. Bandera.

236 SPANISH STYLISTICS (3). A theoretical and practical approach to the study of style. Spring. (Alternate years.) Polo de Bernabé.

237 LITERARY CRITICISM IN SPAIN (3). A study of literary doctrines from the Renaissance to the present. Spring. (Alternate years.) Polo de Bernabé.

238 SPANISH INTELLECTUAL HISTORY I (3). The purpose of this course is to acquaint students with the basic ideology (philosophical, aesthetic, religious, political, economic) underlying Spanish peninsular literature from its origins to the end of the seventeenth century. Binotti.

239 SPANISH INTELLECTUAL HISTORY II (3). This course is a continuation of Spanish 238 and includes Spanish Intellectual History from the eighteenth century to the present.

250 THE EIGHTEENTH CENTURY IN SPAIN (3). Readings from eighteenth-century authors in various genres. Fall. (Alternate years.) Casado.

260 SPANISH EXISTENTIAL LITERATURE AND ITS EUROPEAN CONTEXT (3). An investigation of the relationship between existential thought and fictional form viewed through works by such authors as Baroja, Unamuno, Machado, Ortega y Gasset, Martín-Santos, Bener, Goytisolo, Martín Gaite, Buero Vallejo, Collins.

330 SEMINAR (3). Staff.

340 SPECIAL READINGS (Var.). Member of the graduate faculty (doctoral students only).

393 MASTER'S THESIS (3). Member of the graduate faculty.

394 DOCTORAL DISSERTATION (3). Member of the graduate faculty.

SPANISH AMERICAN

Courses for Graduates and Advanced Undergraduates

113 COLONIAL AND NINETEENTH-CENTURY SPANISH AMERICAN LITERATURE (3). Prerequisites, Spanish 71, 73. Fall. Perelman, Salgado.

114 MODERNIST AND CONTEMPORARY SPANISH AMERICAN LITERATURE (3). Prerequisites, Spanish 71, 73. Spring, Salgado, Perelman, Rivero.

120 THE IMAGE OF WOMAN IN SIXTEENTH-SEVENTEENTH CENTURIES (3). A study of the inscription of femininity in texts by Spanish and American authors. Readings are available in Spanish or in English translation. Lectures are conducted in English. Perelman.

Courses for Graduates

209 NONFICTION PROSE OF THE SIXTEENTH AND SEVENTEENTH CENTURIES (3). Consideration of the histories, chronicles, didactic works of the Renaissance and the Siglo de Oro, with special emphasis on the literature of exploration. Fall. (Alternate years.) Perelman.

241 SPANISH AMERICAN ESSAYS AND SHORT STORIES (3). Spring. (Alternate years.) Perelman, Rivero.

242 SPANISH AMERICAN POETRY (3). Major movements and aesthetic currents. Spring. (Alternate years.) Salgado.

243 SPANISH AMERICAN THEATRE (3). A panoramic view of modern theatre. Fall. (Alternate years.) Salgado.

244 THE AESTHETICS OF THE BAROQUE IN SPANISH AMERICAN LITERATURE (3). The origin, development, and persistence of a baroque aesthetic in Spanish American literature through an examination of diverse theories of baroque and close readings of representative texts. Fall or spring. Perelman.


246 THE NOVEL IN SPANISH AMERICA I (3). A study of the novel to 1960. The course examines Romanticism, Realism, Naturalism, Modernism, and the new national literatures, through such authors as Avellaneda, Blesa, Gana, Silva, Asturias, Carpentier, Rufino. Bombal, Vargas Llosa. Salgado.

247 THE NOVEL IN SPANISH AMERICA II (3). A study of major trends and writers from the "Boom" of the 1960s and 70s to the present. Rivero.

335 SEMINAR IN SPANISH AMERICAN LITERATURE (3). Fall and/or spring. Staff.

CURRICULUM IN RUSSIAN AND EAST EUROPEAN STUDIES

ROBERT M. JENKINS, Chair

Professors
Richard N. Andrews, Public Policy
Richard R. Calhoun, Journalism and Mass Communication
Patrick Conway, Economics
Richard L. Edwards, School of Social Work
Jaroslav Folda, Art
David M. Griffin, History
H. Garland Heshey, Orthodontics
Beth Holmgren, Slavic Languages and Literatures
Laura A. Janda, Slavic Languages and Literatures
Madeline G. Levine, Slavic Languages and Literatures
Bobbie Lubker, School of Education
David McNels, Carolina Environmental Program
Barbara Moran, School of Information and Library Science
Anthony R. Obertshull, Sociology
Michael Peck, Surgery
Barry Popkin, Carolina Population Center
Donald J. Raleigh, History
Steven S. Rosefield, Economics
Joel Schwartz, Political Science
James D. Stashoff, Mathematics
Robert L. Stevenson, Journalism and Mass Communication

**Associate Professors**
Gary Bos, Orthopaedics
E. Willis Brooks, History
Carolyn Conner, Classics
Lawrence E. Feinberg, Slavic Languages and Literatures
Robert D. Greenberg, Slavic Languages and Literatures
Iva Herza-Picciotto, Epidemiology
Christopher Putney, Slavic Languages and Literatures
Marilyn Scott Linton, German
Terry Rhodes, Music
Thomas Ricketts, Health Policy and Administration
Brent Wissick, Music

**Assistant Professors**
Suzanne Gulledge, School of Education
Charles Kurzman, Sociology
David Tate, Medicine
Milada Vachudova, Political Science
Ivana Valetic, Slavic Languages and Literatures
Irene Zipper, School of Social Work

**Lecturers**
Robert Jenkins, Curriculum in Russian and East European Studies
Elobena Magomedova, Slavic Languages and Literatures

**Professors Emeriti**
Joseph Anderle, History
Samuel H. Baron, History
Paul Debeczeny, Slavic Languages and Literatures
Vasa D. Mihailovich, Slavic Languages and Literatures

**Requirements for the M.A. Degree**
The Curriculum in Russian and East European Studies offers graduate work leading up to the degree of Master of Arts in Russian/East European Studies. The degree program satisfies the general requirements of the Graduate School. In addition, the student must fulfill the following curriculum requirements:

- Four semester courses in a Slavic language (Bulgarian, Czech, Macedonian, Polish, Russian, or Serbo-Croatian).
- Completion of HIST 204D, RUES 210, and RUES 230.
- Completion of at least three courses in a given concentration. (Fields of concentration include History, Biology, Business, Environmental Sciences, Classics, Comparative Literature, Computer Science, Ecology, Economics, Environmental Sciences, Geologic Sciences, Health, Journalism, Law, Linguistics, Music, Nonprofit Leadership, Peace, War, and Defense, Philosophy, Political Science, Psychology, Public Health, Slavic Languages and Literatures, Social Work, Sociology, and Statistics.)
- Completion of defense of thesis project.

Further information may be obtained from Robert Jenkins, Program Adviser, The Center for Slavic, Eurasian, and East European Studies, CB# 5125, 223 E. Franklin Street, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-5125. Telephone: (919) 962-0901. Fax: (919) 962-2494. Email: rjenkins@email.unc.edu. Web: www.unc.edu/depts/ruess.

**Courses for Graduates and Advanced Undergraduates**
**RU C 199 SELECTED TOPICS IN RUSSIAN AND EAST EUROPEAN STUDIES (3).** Topic varies by semester. Fall, spring, summer. Staff.

**RU C 210 CORE COLLOQUIUM (1).** Series of follow-up discussions of guest lectures sponsored by the Center for Slavic, Eurasian, and East European Studies. The discussions will be based on bibliographies previously assigned by guest lecturers. Fall.

**RU C 230 IDENTITIES AND TRANSITIONS (3).** Capstone course for MA RUES. Interdisciplinary course focusing on the variety of problems encountered by the societies of East European countries and successor states of the former Soviet Union in their transition from communism to democracy. Spring. Jenkins.

**RU C 299 INDEPENDENT STUDY IN RUSSIAN AND EAST EUROPEAN STUDIES (Var).** Allows students to undertake advanced research under the supervision of a faculty member. Fall, spring, summer. Staff.

**RU C 310 GRADUATE SEMINAR IN RUSSIAN AND EAST EUROPEAN STUDIES (3).** Advanced seminar. Topics vary. Fall, spring. Staff.

**RU C 393 MASTER’S THESIS (3).** Fall, spring, or summer.

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**DEPARTMENT OF SLAVIC LANGUAGES AND LITERATURES**

**BETH HOLMGREN, Chair**

**Professors**
Beth Holmgren (10) Russian and Polish Literature
Maseline G. Levine (4) Russian and Polish Literature
Laura A. Janda (8) Slavic Languages and Literatures

**Associate Professors**
Lawrence Feinberg (3) Slavic Linguistics, Poetics
Robert D. Greenberg (11) Slavic Languages and Literatures
Christopher Putney (12) Russian Literature, Medieval Slavic Culture

**Assistant Professor**
Ivana Valetic (13) Russian Literature and Literature, Russian Language

**Professor Emeritus**
Paul Debeczeny
Vasa D. Mihailovich

The Department of Slavic Languages and Literatures offers graduate work leading to the degrees of Master of Arts and Doctor of Philosophy. The degree programs meet general requirements of the Graduate School plus certain departmental requirements.

**Requirements for the M.A. Degree**

For the degree of Master of Arts a student may emphasize Russian literature and culture, Slavic and East European literatures and cultures, or Slavic linguistics. All students are required to take the department's pro-seminar, SLAV 393 (three credits), and to write and defend a master's thesis. In addition, the student must satisfy a language requirement (reading knowledge only) in one modern foreign language other than a Slavic language. The master's candidate in Russian literature and culture is required to take a) one course in either medieval or sixteenth-century Russian literature and culture and b) four courses to be distributed, with graduate advisor supervision, in nineteenth- and twentieth-century Russian literature and culture. The master's candidate in comparative Slavic and East European literatures and cultures is required to take a) three courses in Russian literature and culture and b) two comparative Russian and Slavic/East European literature
and culture courses or two exclusively non-Russian Slavic/East European literature and culture courses. She must also take two courses in Slavic linguistics, either Evolution of Russian (RUSS 100) or Structure of Russian (RUSS 101) and one other track-relevant linguistics course. The student must also complete two courses (one year) in a modern Slavic/East European language other than Russian.

The master's candidate in Slavic linguistics is required to take at least three courses in Slavic linguistics, including Evolution of Russian (RUSS 100) and Structure of Russian (RUSS 101); two courses (one year) in a modern Slavic/East European language other than Russian, and at least two courses in Russian or another Slavic/East European literature. She must take at least one course outside the department in linguistics (normally Introduction to Historical and Comparative Linguistics [LING 101], or Introduction to Descriptive Linguistics [LING 120]). A master's candidate in Slavic linguistics must also either pass or place out of Fourth-Year Russian Conversation and Reading (RUSS 112). The student may take one elective course (three hours).

Requirements for the Ph.D. Degree

An admitted candidate must have received an M.A. degree from this University or be able to show that his or her previous studies have provided a knowledge of the Slavic field comparable to that required for the M.A. degree at UNC-Chapel Hill. A student may concentrate in Russian literature and culture, comparative Slavic and East European literatures, and cultures, or Slavic linguistics.

All students who have completed the master's degree at UNC-Chapel Hill or at another institution and who wish to advance to Ph.D. candidacy must take a qualifying comprehensive examination no later than the third semester of registration following completion of all master's degree requirements.

Detailed information about the written and oral Ph.D. comprehensive examinations is available from the department in a separate handout.

Teaching experience is an essential part of professional training. Therefore, teaching assistant instruction equivalent to at least three contact hours a week for one semester is required of all Ph.D. candidates.

Before advancing to candidacy, doctoral students are required to submit a written dissertation proposal and to defend it before their dissertation committee. In order to facilitate this process, students are required to earn the grade of "Satisfactory" in SLAV 360 (research and writing of the dissertation proposal).

Students must register for at least six credits of SLAV 394 (dissertation). The final step after writing the dissertation under supervision of a faculty adviser is the oral defense of the dissertation, which will take place at least one week before the dissertation is to be submitted to the Graduate School and one month after it is submitted to the student's faculty committee.

Special Requirements for Degree Programs

The candidate in Russian literature must demonstrate a sound knowledge of Russian literature and competence in one other Slavic literature. Candidates for the doctorate in Russian literature must have taken the seminar in Old Russian literature (Russian 259) before they take their doctoral examinations. The candidate in a Slavic literature other than Russian must demonstrate a sound knowledge of that literature and competence in Russian literature.

The candidate for the doctoral degree with a concentration in Slavic linguistics must demonstrate a good working knowledge of Russian, and of one West Slavic and one South Slavic language.

BULGARIAN

101, 102 ELEMENTARY BULGARIAN (3 each). Pronunciation, structure of language, and reading in modern Bulgarian. Fall and spring. Greenberg.

103, 104 INTERMEDIATE BULGARIAN (3 each). Continuation of the proficiency-based instruction begun in Elementary Bulgarian. Fall and spring. Greenberg.

105, 106 ADVANCED BULGARIAN (3 each). Advanced readings and discussion in Bulgarian in humanities and social science topics. Greenberg.

111 BULGARIAN LITERATURE (3). Introduction to Bulgarian literature in English translation. Some readings in Bulgarian for students who can read the language. Staff.

CZECH


103, 104 INTERMEDIATE CZECH (3 each). Continuation of the proficiency-based instruction begun in Elementary Czech. Fall and spring. Janda.

105, 106 ADVANCED CZECH (3 each). Advanced readings and discussion in Czech in humanities and social science topics. Janda.

111 CZECH LITERATURE (3). Introduction to Czech literature in English translation. Some readings in Czech for students who can read the language. Staff.

MACEDONIAN


103, 104 INTERMEDIATE MACEDONIAN (3 each). Continuation of the proficiency-based instruction begun in Elementary Macedonian. Fall and spring. Greenberg.

105, 106 ADVANCED MACEDONIAN (3 each). Advanced readings and discussion in Macedonian in humanities and social science topics. Greenberg.

POLISH

100 INTENSIVE ELEMENTARY POLISH (6). Pronunciation, structure of language, and reading in modern Polish. Equivalent to a full-year course for advanced undergraduate and graduate students. Summer. Staff.


103, 104 INTERMEDIATE POLISH (3 each). Continuation of the proficiency-based instruction begun in Elementary Polish. Holmgren, Levine.

105, 106 ADVANCED POLISH (3 each). Advanced readings and discussion in Polish in humanities and social science topics. Holmgren, Levine.

111 NINETEENTH-CENTURY POLISH LITERATURE AND CULTURE (3). A survey of the major works of nineteenth-century Polish literature and culture in English translation. Some readings in Polish for students who can use the language. Holmgren, Levine.

112 TWENTIETH-CENTURY POLISH LITERATURE AND CULTURE (3). A survey of the major works of twentieth-century Polish literature and culture in English translation. Some readings in Polish for students who can use the language. Holmgren, Levine.

RUSSIAN

100 THE EVOLUTION OF THE RUSSIAN LANGUAGE (3). This course traces the development of Russian from Old Russian to contemporary Russian. Consideration
is given to linguistic developments as well as cultural, social, and historical circumstances shaping contemporary Russian. Fall and spring. Feinberg, Greenberg, Janda.


101X, 102X ELEMENTARY RUSSIAN FOR GRADUATE STUDENTS (0). Designed for preparation for reading knowledge examination for higher degrees. Passing of 102X certifies that this requirement has been satisfied. Fall and spring. Staff.

105, 106 ADVANCED RUSSIAN GRAMMAR (3). Prerequisite. Russian 4. A comprehensive review of Russian grammar on an advanced level, emphasizing reading and writing skills. Fall and spring. Staff.

111, 112 ADVANCED RUSSIAN CONVERSATION AND COMPOSITION (3). Designed to develop conversational and writing skills in a variety of situations and subjects. Russian used, except for a minimum of linguistic explanations or comments. Fall and spring. Magomedova.

113 RUSSIAN CONVERSATION AND COMPOSITION (6). Prerequisite. Russian 50 or equivalent. Fourth-year course, designed to develop conversational and writing skills in a variety of situations and subjects. Exclusively in Russian. Equivalent to a full-year course, for advanced undergraduate and graduate students. Summer. Staff.

125 TOPICS IN RUSSIAN LITERATURE (3). Material not presently covered in any course. The specific topic is announced in advance.

135 LITERATURE AND MUSIC IN RUSSIA (3). Explores the use Russian composers have made of literary works and motifs, as well as the response of Russian writers to musical compositions and composers, and to music as art form. Spring. Feinberg.

151 PUSHKIN (3). Study of major works. Fall. Staff.

160 RUSSIAN SENTIMENTALISM AND ROMANTICISM (3). Prerequisite. Russian 106 or permission of the instructor. Survey of Russian sentimentalism and romanticism, with special attention to the intellectual currents of the period (c. 1770 to 1850). Consideration of Western precursors (Rousseau, Sterne, Byron, et al). Readings in Russian.

162 RUSSIAN POETRY OF THE NINETEENTH CENTURY (3). Readings and lectures on nineteenth-century Russian poetry. Staff.

164 DOSTOEVSKY (3). Study of major works of Dostoevsky and a survey of contemporary authors and literary trends relevant to his creative career. Readings in Russian for majors, in English for nonmajors. Fall. Levine. Putney.

165 CHEKHOV (3). Study of major works of Chekhov and a survey of contemporary authors and literary trends relevant to his creative career. Readings in Russian for majors, in English for nonmajors. Spring. Holmgren.


171 GOGOL (3). Study of major works of N. V. Gogol and a survey of contemporary authors and literary trends relevant to his creative career. Lectures and seminar discussions. Readings in Russian for majors, in English for nonmajors. Fall. Putney.

179 TOLSTOY (3). Study of major works of Tolstoy and a survey of contemporary authors and literary trends relevant to his creative career. Readings in Russian for majors, in English for nonmajors. Spring. Levine, Vuletic.

186 CONTEMPORARY RUSSIAN WOMEN'S WRITING (WWMST 186) (3). A study of Russian women's writing after World War II, including both fictional and nonfictional works analyzed in their socio-political context. Serves as an introduction to Russian women's studies. Holmgren.

187 POST-STALIN SOVIET LITERATURE (3). This course examines the major literary trends of the post-Stalin period in Soviet literature. Spring. Holmgren.

190, 191 TEACHING METHODS AND MATERIALS (1). For prospective teachers of Russian. Required of all teaching assistants. Fall and spring. Magomedova.

193 RUSSIAN SHORT STORY (3). An introduction to the Russian short story. The readings, in English for nonmajors and in Russian for majors, include works from the seventeenth century to the present. Fall and spring. Holmgren.

207 RUSSIAN STYLISTICS (3). Prerequisite. Russian 112. Advanced Russian conversation and composition, with appropriate grammatical and stylistic explanations. Can be taken repeatedly for credit, but only counts once toward degree requirements. Fall. Magomedova.

208 RUSSIAN STYLISTICS (3). Second semester. Prerequisite, Russian 207. Continuation of Russian 207 at a more advanced level. Spring. Magomedova.

209 RUSSIAN STYLISTICS (6). Prerequisite. Russian 112 or equivalent. An intensive fifth-year course designed to practice advanced conversation and composition, with appropriate grammatical and stylistic explanations. For graduate students, exclusively in Russian. Equivalent to a full-year course. Summer. Staff.

251 PUSHKIN (3). Study of major works. Fall. Staff.

259 MEDIEVAL AND BAROQUE RUSSIAN LITERATURE (3). Literature from the advent of literacy to the late seventeenth century. Lectures on and interpretations of literature of Kiev Rus' down to Grand Muscovy. Readings in English for non-Slavic concentrators. Putney.


263 THE RISE OF RUSSIAN PROSE FICTION (3). Prerequisite, Russian 22 or permission of the instructor. Russian prose of the first half of the nineteenth century, with special emphasis on the prose of Pushkin, Lermontov, and Gogol. Spring. Staff.

266 RUSSIAN SYMBOLISM (3). Prerequisite, reading knowledge of Russian or permission of the instructor. Introduction to the leading writers and works of the Symbolist movement in Russia. Feinberg, Vuletic.

267 POST-SYMBOLIST POETRY (3). Prerequisite, reading knowledge of Russian or permission of the instructor. A study of the major poetic works of Gumilev, Akhmatova, Mandelstam, Mayakovsky, Khlebnikov, Pasternak, Tsvetova. Spring. Levine, Vuletic.


294 STRUCTURAL ANALYSIS OF RUSSIAN VERSE (3). An examination of how attention to verbal structure can deepen our analysis of poetic texts. Analysis of individual Russian poems, combined with extensive reading in formalist/structuralist theory. Fall. Feinberg.

350 SEMINAR IN RUSSIAN LITERATURE (3). Prerequisite, permission of the instructor. Seminar on selected topics in Russian literature.

393 MASTER'S THESIS (3). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

SERBO-CROATIAN


103, 104 INTERMEDIATE SERBO-CROATIAN (3 each). Continuation of the proficiency-based instruction begun in Elementary Serbo-Croatian. Greenberg, Vuletic.
105, 106 ADVANCED SERBO-CROATIAN (3 each). Advanced readings and discussion in Serbo-Croatian in humanities and social science topics. Valerie.

111 SERBO-CROATIAN LITERATURE (3). Introduction to Serbo-Croatian literature in English translation. Some readings in Serbo-Croatian for students who can read the language. Valerie.

**SLAVIC**


105 INTRODUCTION TO SLAVIC LINGUISTICS (3). The phonological history of Slavic languages from the late Indo-European to the split of the Common Slavic linguistic unity. Spring. Feinberg, Greenberg, Janda.

107 STRUCTURE OF A BALKAN LANGUAGE (Linguistics 107) (3). Study of grammar and readings in selected languages. Choice of language based on student interest: Albanian, Bulgarian, Macedonian, Romany, Turkish; also some adjacent languages: Georgian and Tajik. Fall and spring. Greenberg.

108 ADVANCED STRUCTURE OF A BALKAN LANGUAGE (Linguistics 108) (3). Continuation of Slavic 107 at a more advanced level. Fall and spring. Greenberg.


125 TOPICS IN SLAVIC LITERATURE (3). Material not presently covered in any course. The specific topic is announced in advance.

144 CHRISTIANIZATION OF THE SLAVS (3). Survey of the Christianization of Slavs from the ninth to the fourteenth century. Themes include Byzantine missions, emergence of literary centers, and role of Balkans. Readings in English for non-Slavic concentrators. Puney.

160 READING OTHER CULTURES: ISSUES IN LITERARY TRANSLATION (CMLT 160) (3). Prerequisite: knowledge of another language other than English. Starting from the proposition that cultural literacy would be impossible without reliance on translations, this course addresses fundamental issues in the practice and politics of literary translation. Spring. Levine.

164 IMAGINED JEWS: JEWISH THEMES IN POLISH AND RUSSIAN LITERATURE (3). "Imagined Jews" explores the fictional representation of Jewish life in Russia and Poland by Russian, Polish and Jewish authors from the nineteenth century to the present. Holmgren, Levine.


167 ETHNIC AND LINGUISTIC CONFLICTS IN THE FORMER YUGOSLAVIA (PWAD 167) (3). The role of linguistic controversies in the polarization of ethnic identities in the former Yugoslavia. Topics: the Yugoslav idea, language and nationalism, ethnic tension, the unbinding of ethnic conflicts. Greenberg.

169 SLAVIC IMMIGRANT EXPERIENCE IN LITERATURE (3). Fictional and autobiographical expressions of the Slavic and Eastern European immigrant experience in the twentieth century. Readings include Russian, Polish, Jewish, and Czech authors from early 1900's to the present. Holmgren, Levine.

170 TWENTIETH-CENTURY RUSSIAN AND POLISH THEATER (3). A comparative survey of the major trends in twentieth-century Russian and Polish dramatic and theatrical production, with attention to aesthetic, professional, and political connections between the two. Holmgren.


200 PRO-SEMINAR IN SLAVIC LITERATURE (3). Prerequisite: graduate students only. A seminar that acquaints graduate students with the basic resources for conducting research in their field and trains them in various critical approaches to the analysis of Slavic literatures. Holmgren.

240 READING COURSE (3 or more). (On demand.) Staff.

251 EAST SLAVIC LINGUISTICS (3). Prerequisites: Slavic 105 and four years of study of any East Slavic language. An examination of the linguistic history and contemporary dialectology of the East Slavic languages (Russian, Ukrainian, Belarusian); with emphasis on Russian. Feinberg.

252 WEST SLAVIC LINGUISTICS (3). Prerequisites: Slavic 105 and/or Slavic 207 and one year of any West Slavic language. An examination of the linguistic history and contemporary dialectology of the West Slavic Languages (Polish, Czech, Slovak, Upper and Lower Sorbian, Krasnodar, Slovenian, Pomeranian). Janda.

253 SOUTH SLAVIC LINGUISTICS (3). Prerequisites: Slavic 105 and one year of any South Slavic Language. An examination of the linguistic history and contemporary dialectology of the living South Slavic languages (Slovenian, Serbo-Croatian, Macedonian, Bulgarian). Greenberg.

260 TOPICS IN SLAVIC SOCIOLOGY (3). A seminar that acquaints graduate students with the variety of approaches to sociological research with particular emphasis on the extant literature in Slavic sociological, language and identity, and nation. Fall, spring. Greenberg.

305 SEMINAR IN SLAVIC LINGUISTICS (3). Selected issues in Slavic synchronic and diachronic linguistics. Staff.

360 PRE-DISSERATION RESEARCH (3). Staff.

393 MASTER'S THESIS (3 or more). Staff.

394 DOCTORAL DISSERTATION (3 or more). Staff.

**SCHOOL OF SOCIAL WORK**

JACK M. RICHMAN, Interim Dean

Professors
Oscar A. Barbarin III (380) Child/Adult Health and Mental Health, African American Children and Families, Family and School Interventions
Richard V. Barth (310) Child Abuse and Neglect, Foster Care Dynamics, Adoption Policies, Foster Care, Program Evaluation, Linkages between Child Welfare and Juvenile Justice Policies
Iris B. Carlton-LaNey (239) Social Welfare History, Especially African Americans and the Progressive Era, Rural Elderly African American Women and Social Support
Philip W. Cooke (5) Human Services Planning and Administration, Performance Management, Community Partnerships
Andrew W. Dibelstein (7) Local Political Systems, Aging, Social Welfare Policy
Walter C. Farrell Jr. (351) Community Health Practice, Cultural Competence and Discrimination in Human Services, Inequality, Hispanic Immigrants, Civic Entrepreneurship, Community Economic Development, Educational Social Policy
Mark W. Fraser (229) Etiology, Prevention and Treatment of Antisocial, Aggressive Behavior in Childhood and Early Adolescence, Child and Family Services, Research Scholarship in Social Work

School of Social Work 301
Maeda J. Galinsky (355) Social Group Work Practice, Theory and Research, Evaluation of Social Intervention, Multicultural Practice
Dennis K. Orthner (82) Research Methods, Program Evaluation, Public Welfare and Family Policy, Family Strength, Military Families
Jack M. Richman (88) Individual, Couples, and Family Practice, Social Support, At-Risk Students, Evaluation
Kathleen A. Rounds (312) Social Work in Health Care, Families and Health, Program Evaluation
Charles L. Uhler (227) Social Program Evaluation, Quantitative Research Methods, Human Services Management
Marie O. Wil (95) Community Practice, Social Administration, Services to Families and Children, Community Development, Social Work and the Law

Visiting Professor
Bruce B. Henderson (284) Child Development, Development in Educational Contexts

Clinical Professors
Nancy S. Dickinson (304) Social Welfare Policy, Continuing Social Work Education, Children and Family Services, Community Practice
Raymond S. Kirk (245) Human Services Administration, Child Welfare Services, Social Systems Research

Associate Professors
S. Rachel Dedmon (38) Mental Disorders, Mental Health Practice, Ethics in Social Work Practice
Vanessa G. Hodges (241) Practice Research and Evaluation, Families and Children, Interventions with Families of Color, Social Support
Sheryl I. Zimmerman (295) Evaluation of Practice, Social Gerontology, Psychosocial Aspects of Health, Long Term Care, Outcome Research, Methods for Studying Older Populations, Dementia, Hip Fracture

Clinical Associate Professors
Margaret Burnley-Spearman (381) Culturally Competent Social Work Practice, Organizational Development, Managing for Diversity
Katherine M. Dunlap (52) Preschool Education, Empowerment of Parents and Parent Education, Medical Social Work, Violence Prevention
Dorothy N. Gamble (64) Community Organization, Social Action, Community Development, Sustainable Development
Judith H. Goodhand (412) Children and Family Services, Administration, Management and Planning, Child Welfare
Andrea Y. Meier (382) Process Evaluation, Counseling, Use of Internet in Therapy, Kelly B. Reath (107) Rural Human Services, Policy Implementation
Mary Anne P. Salmon (219) Aging Issues with Focus on Underserved Populations, Survey Development, Aging and Demographics
Florence G. Selby (104) Social Gerontology, Ethics, End-of-Life Decisions, Interdisciplinary Clinical Assessment/Teams, Rural and Highly Vulnerable Older Individuals in Communities and Institutions
Jay C. Williams (265) Psychoanalytic Psychotherapy, Children and Adolescents, Brief Treatment, Child Group Therapy
Laura J. Zimmerman (266) Computer Technology in Human Services, Information and Referral Systems
Irene Nathan Zipper (27) Early Childhood Intervention, Children's Mental Health Services, Service Coordination/Case Management, Service Integration

Research Associate Professors
Natasha K. Bowes (350) School Social Work, Behavioral Problems, Structural Equation Modeling
Dean F. Duncan III (280) Program Evaluation, Management of Human Services Agencies, Research Methods
Amir H. Rezvani (353) Biomedical Basis of Addiction, Substance Abuse

Visiting Clinical Associate Professor
Jane Perkins (226) Child Health, Civil Rights, Publicly Funded Managed Care

Assistant Professors
Mimi V. Chapman (413) Social Work Practice, Child Abuse and Neglect, Children's Health and Mental Health
Amelia C. Roberts (292) Women and Chemical Dependency, Cultural Diversity and Social Work Practice, Spirituality and Social Work Practice and Research in Perinatal Substance Abuse
Paul R. Sznoskowski (101) Family Stress, Children in Poverty, Prevention Program Development, Risk and Resilience

Visiting Assistant Professor
George M. Gastfied (018) Native Americans, Residential Institutions for Children, Birth Order

Clinical Assistant Professors
George P. Cole (296) Child Maltreatment, The Biology of Behavior, Brain Chemistry and Behavior, Integration of Practice and Research, Brain Injury
Lane G. Cooke (360) Family-Centered Services/Home-Based Services Delivery Systems in Communities and Neighborhoods, Family Preservation Programs, Child Abuse/Neglect, Family Violence, Rapid Assessment and Planning
Mary E. Fraser (251) Managed Behavioral Health Care, Severe and Persistent Mental Illness, Mental Health Policy, Organizational and Community Behavior, Nonprofit Administration
Thomas W. Fuhrman (361) Crisis Intervention, Organizational Psychology, Community-Based Behavioral Health Care
Denise L. Gammonley (244) Severe and Persistent Mental Illness in Late Life, Peer and Lay Helper Interventions, Practice with Immigrants and Older Adults, International Social Work Education
Margaret L. Morse (398) Computer-based Training, Website Design
James H. Palmer (900) Adolescent Substance Abuse Prevention, Early Intervention, Family Oriented Treatment, School Social Work
Julia Searl Rust (426) Families and Children, Disability, Qualitative Methods
Anna M. Scheyert (222) Community-Based Services for Adults with Severe and Persistent Mental Illness, Mental Health Policy, Managed Behavioral Health Care, Case Management, Substance Abuse Services, Welfare Reform
Evelyn S. Williams (105) Child Welfare, Domestic Violence, Cultural Competence, Staff Development, Training, and Supervision, Organizational Change

Research Assistant Professor
Judith B. Wildfire (279) Welfare Issues, Children's Issues, Program Evaluation

Clinical Instructors
Jane A. Armstrong (384) Older Adults, Substance Abuse and Elder Abuse, Geriatric Mental Health, MRDD, Death and Dying Issues
Christine S. Berrier (385) Community Practice, Child Welfare, Adoption
Lynnd W. Bolton (294) Substance Abuse Services, Mental Health
Natalie R. Bournan (270) Multiple Family Group Therapy, Family Therapy
Jean Livermore Byassoe (291) Children's Mental Health, Family/Provider Partnership, Learning and Attention Disorders in Children and Adults
Joanne S. Caye (260) Child Welfare, Family-Centered Practice, Effects of Disasters on Families and Children
Steven H. Day (387) Program Evaluation, Delinquency Prevention, Community Planning and Development
The M.S.W. Program

Students complete the foundation curriculum of twenty-six credit hours of content in the area of research, social work practice, social policy, human behavior and the social environment, institutionalized discrimination, and field education.

In the advanced curriculum students choose an area of concentration for an additional thirty-six credit hours. There are two concentrations in the advanced curriculum. The Direct Practice Concentration consists of three fields of practice: Aging, Health/Mental Health, and Families and Children. The Management and Community Practice Concentration consists of four fields of practice: Aging, Broad-based Human Services, Health/Mental Health, and Families and Children.

In the Direct Practice Concentration, students are prepared for advanced practice with particular populations and social units. In the Management and Community Practice Concentration, students are prepared for administration and large-systems interventions in a particular field of practice.

Students develop individualized plans of study in consultation with their advisors, and their course selection must be guided by the distributional requirements of the concentration they have selected. However, students can combine interests in direct services and macro practice and pursue learning and career goals related to more than one area of concentration.

Admission is based on an evaluation of the applicant’s transcripts, references, written statement of interests in the field, Graduate Record Examination scores, and readiness to undertake graduate professional education. The applicant must have received a bachelor’s degree from a college or university, preferably with a broad liberal arts preparation in social and biological sciences and humanities.

The Triangle part-time program is located in Durham, and additional part-time programs are located in Asheville and Fayetteville. The first year of graduate professional education is taken on a part-time basis over two successive academic years. Admission to these programs is granted on the same basis as admission to the full-time program. Upon completion of the first-year requirements, the part-time student completes the degree as a full-time student on the Chapel Hill campus.

The normal time period for degree completion is four semesters of full-time study. However, graduates of undergraduate social work programs which are accredited by the Council on Social Work Education, who meet specific course and admissions requirements, are eligible to apply for a limited number of advanced standing positions. These students fulfill the degree requirements through two summer sessions and two semesters. The undergraduate major course work is considered approximately equivalent to the first year of graduate study.

The Ph.D. Program in Social Work

The Ph.D. Program in Social Work is designed to meet the growing demand for social work and social welfare research scholars in academic and research settings. Graduates are prepared to conduct a variety of theory construction and research activities that include building, testing, and refining explanatory theory for understanding personal and social problems, and practice theory for understanding change processes; designing social interventions that test explanatory and/or practice theory; and assessing the effects of planned social interventions through models of process, outcome, and impact evaluation.
The curriculum is grounded in core social work and social welfare courses and thorough training in research methodology and data analysis. At the same time, students design their program of study around their special area(s) of interest and complete a supporting program which requires focus on a social problem and intervention of concern to the student.

In the admissions process, students are asked to provide evidence of:

* A master's degree in social work from a school accredited by the Council on Social Work Education, or a master's degree in a related discipline;
* Academic ability, as demonstrated in academic achievement and Graduate Record Examination scores;
* Commitment to the values, goals, and purposes of the social work profession;
* Two years of work experience in human services; and
* A direction for and commitment to scholarly work congruent with the objectives and resources of the doctoral program.

**Courses for Graduates and Advanced Undergraduates**

**101 FOUNDATIONS OF SOCIAL WELFARE AND SOCIAL WORK (3).** Introduces public welfare policy through lecture and discussion of the purposes public welfare serves; describes the most important programs created by those policies.

**102 INTRODUCTION TO RESEARCH METHODS IN SOCIAL WORK (3).** This course introduces the student to scientific research methods. Topics include: problem formulation and definition; hypothesis formulation; measures of central tendency; causality; research designs; measurement; data collection; and data analysis.

**103 FAMILY AND INDIVIDUAL DEVELOPMENT (3).** Study of family and individual development that examines inclusive definitions; structural variations; theories; and strengths, stressors, and changes that affect functioning.

**106 RACISM: IMPLICATIONS FOR HUMAN SERVICES (3).** This course organizes focus will be how to work with minority groups, especially African Americans. The conceptual framework will be directed toward relationship building to enhance service delivery.

**129 MANAGING THE EFFECTS OF DISASTERS ON FAMILIES AND CHILDREN (3).** Designed to examine the effects that disasters have on children, their families, and communities, this course gives students an understanding of how to deal with survivors' reactions to trauma and how to decrease the chances of long-term damage when long-term disaster strikes.

**150 PUBLIC SERVICE AND SOCIAL CHANGE (4).** Course examines role of volunteer involvement and citizen participation in community development, grassroots organizing, advocacy, and other efforts to create a more just and democratic society. Service learning requirement.

**180 SPECIAL TOPICS IN SOCIAL WORK (1-6).** Focuses on current social work issues, including human behavior and the social environment, practice methods, social policy, and research. The focus will be specified each time the course is offered.

**198 FOUNDATIONS OF FAMILY BEHAVIOR (3).** Review of family research and interventions that serve as a foundation for promoting constructive family development and interactions.

**199 SCHOOL SOCIAL WORK POLICY/PRACTICE (3).** Prerequisite, SOWO 227, equivalent course, or permission of instructor. An examination of public school social work policy and practice. The course emphasizes an ecological approach within the context of the school-family-community environment.

**Courses for Graduates**

**203 DISCRIMINATION AND INEQUALITY (3).** Examines discrimination and its implications for social work practice. Particular attention is paid to issues of race and gender and the consequences of social inequality on individuals and families.

**219 PRE-CONCENTRATION PRACTICUM FOR ADVANCED STANDING STUDENTS (4).** Course designed to assist students in summer classroom learning with direct experience in specialized field of practices and serves to bridge the BASW practicum with advanced concentration practicum. (Field fee $300)

**220 SOCIAL WORK PRACTICUM I (4).** Students learn beginning practice skills through experiential opportunities and apply core knowledge to direct (individuals, families, groups) and macro (organizations, communities) social work practice two days per week in an agency setting. (Field fee $300)

**221 SOCIAL WORK PRACTICUM II (4).** A continuation of SOWO 220, providing opportunities for students to demonstrate increased ability to assess, plan, administer, and evaluate appropriate social work practice interventions. (Field fee $300)

**222 SOCIAL WORK PRACTICUM III (6).** Students apply specialized knowledge to social work practice at an advanced level with individuals, families, small groups, organizations, and/or communities in an agency of a specialized field. (Field fee $300)

**223 SOCIAL WORK PRACTICUM IV (6).** A continuation of SOWO 222 providing opportunities for the students to demonstrate increased ability to assess, plan, administer, and evaluate appropriate social work interventions in a specialized field of practice. (Field fee $300)

**224 SOCIAL WORK PRACTICE WITH ORGANIZATIONS AND COMMUNITIES (3).** Participants explore frameworks, values, and skills to meet individual and family needs through interventions with work groups, organizations, and communities.

**227 SOCIAL WORK PRACTICE WITH INDIVIDUALS AND FAMILIES (3).** Provides the foundation for social work practice with individuals and their families. It emphasizes basic knowledge, analytic and practice skills, and values necessary for practice.

**228 SOCIAL WORK PRACTICE WITH GROUPS (3).** Prerequisite or corequisite, SOWO 227. Enables students to become more knowledgeable and skillful as social group workers. Phases of group development and worker tasks in each phase provide the course framework.

**300 ADULT HEALTH AND MENTAL HEALTH (3).** Prerequisite, SOWO 103. This course examines adult health and mental health conditions and focuses on the impact these have on individual and family development and functioning.

**335 FAMILY STRESS: COPING AND SOCIAL SUPPORT (3).** Prerequisite, SOWO 103. A review of theories and research on family stress, coping, and social support; an examination of family resources and adaptation associated with life cycle transitions, environmental situations, and catastrophic events.

**334 CHILD AND ADOLESCENT HEALTH AND MENTAL HEALTH (3).** Prerequisite, SOWO 103. Reviews theories and research that serve as a foundation for assessing and serving children with serious health problems, physical disabilities, and mental disorders.

**326 HUMAN BEHAVIOR OF AGING (3).** Prerequisite, SOWO 103. A presentation of major biological, psychological, and sociological theories used to understand the normal aging process. The course surveys pathologies and functional disorders associated with aging. Special emphasis given to disadvantaged populations.

**327 HEALTH, ILLNESS, DISABILITY (3).** Prerequisite, SOWO 103. Examines psychosocial and biological determinants of health, illness, and disability throughout the life cycle and the impact of illness and disability on individual and family development and functioning.

**328 SUSTAINABLE DEVELOPMENT (3).** Prerequisite, SOWO 224, equivalent course, or permission of instructor. Examines perspectives and models of sustainable development. Students will analyze a project and present a participatory plan for engaging in sustainable development work.

**329 ORGANIZATIONAL AND COMMUNITY BEHAVIOR (3).** Prerequisite, SOWO 103. Explores theories and models for understanding the political, economic, and institutional environment for community planning and the development and management of human services policies and programs.
242 FAMILY-CENTERED SOCIAL WORK PRACTICE (3). Prerequisite or corequisite, SOWO 233. Seminar introduces students to family-centered social work practice. Course provides a theoretical base for developing direct practice skills in the treatment of the family as a unit.

243 SOCIAL WORK PRACTICE WITH COUPLES (3). Prerequisite, SOWO 227. A clinical seminar that analyzes the operations and character of couples counseling as a human services technique.

244 APPROACHES TO BRIEF TREATMENT (3). Prerequisite, SOWO 227 or permission of instructor. Clinical seminar introduces students to various types of brief treatment, including crisis intervention, psychodynamic, cognitive, behavioral, and solution-focused.

246 DIRECT PRACTICE WITH AGING POPULATIONS (3). Prerequisite or corequisite, SOWO 236. This course addresses social work practice with elderly in areas of individual and family treatment - group work, case management, supervision, consultation and training, and beginning skills in program planning and administration.

247 HEALTH AND MENTAL HEALTH PRACTICE WITH ADULTS (3). Prerequisite or corequisite, SOWO 230. Seminar on clinical health and mental health social work practice with adults covers assessment and a wide range of theoretically based interventions. Course includes lectures and experiential exercises.

248 HEALTH AND MENTAL HEALTH PRACTICE WITH CHILDREN AND ADOLESCENTS (3). Prerequisite or corequisite, SOWO 234. This course prepares students for health and mental health practice with children and adolescents and their families. Prevention, assessment, and social intervention will be addressed.

249 NONPROFIT AND PUBLIC MANAGEMENT (3). Prerequisite or corequisite, SOWO 239. Examines social work leadership in management and community practice within complex political and economic environments. Emphasizes social work values and intervention methods.

250 COMMUNITY PRACTICE AND PLANNING (3). Prerequisite, SOWO 224, equivalent course, or permission of instructor. Course focuses on roles and skills in community development, planning and organizing, and on analysis of community practice models. Students will provide peer training in their special interest area.

251 CITIZEN PARTICIPATION AND VOLUNTEER INVOLVEMENT (3). Prerequisite, SOWO 224, equivalent course, or permission of instructor. Examines the role of grassroots organizations in advocacy, self-help, and social development; involvement of citizens in public planning; and development of volunteer programs.

252 ALCOHOL, TOBACCO, AND OTHER DRUGS (ATOD): ABUSE AND DEPENDENCE (3). Surveys the field of substance use, abuse, and dependency, providing an overview of macro and micro issues and using the Bio-Psycho-Social-Spiritual model of addictions.

254 MARKETING AND FUNDRAISING FOR NONPROFIT ORGANIZATIONS (3). Prerequisite, SOWO 224, equivalent course or permission of instructor. This course helps students to develop skills and practices associated with marketing and fund-raising for nonprofit organizations at the macro level.

255 ANTSOCIAL BEHAVIOR IN CHILDHOOD AND EARLY ADOLESCENCE: THEORY AND PRACTICE (3). Prerequisite, SOWO 227. This course explores theories and investigative methods related to practice with children who have antisocial, aggressive behavior. Emphasis is placed on using protective/risk factors to design multi-system service strategies.

256 EXECUTIVE LEADERSHIP IN NONPROFIT ORGANIZATIONS (3). Prerequisite, SOWO 224, equivalent course, or permission of instructor. An in-depth analysis of the executive role in nonprofit organizations particularly in leadership transitions, strategic planning, board development, policy administration, governance, employee relations, and resource planning and acquisition.

259 SEMINAR IN WELFARE REFORM (3). Prerequisite, permission of instructor. A seminar to explore current welfare reform legislation that affects the way public assistance to families and children is provided in the United States.

262 CHILDREN'S SERVICES POLICIES AND PROGRAMS (3). Prerequisite, SOWO 101. This course addresses federal, state, and local children's policies and programs. Students learn to analyze child welfare, mental health, and allied policies, regulations, and programs influencing children's services.

264 FAMILY POLICY (3). Prerequisite, SOWO 101. Examines policies affecting families in order to develop a broad understanding of various policy alternatives, their consequences, and the role of social workers as policy advocates.

266 AGING AND PUBLIC POLICY (PSYC 607, DENT 607) (3). Prerequisite, SOWO 101. Students learn of social service, health, and income policy with the aged. Issues pertaining to informal support systems and disadvantaged groups are explored in the context of aging policy.

267 HEALTH AND MENTAL HEALTH POLICY (3). Prerequisite, SOWO 101. Examines national and state health/mental health policy, focusing on historical, legal, socio-political, and economic factors influencing financing, access, and service delivery. Explores skills and strategies for policy analysis and change.

269 ADMINISTRATIVE AND LEGISLATIVE POLICY DEVELOPMENT (3). Prerequisite, SOWO 101. Designed as a seminar, this course provides the opportunities to study the processes of administrative policy making and to apply knowledge of policy making to specialization policy issues and problems.

272 SERVICES FOR PERSONS IN GRIEF (3). Understand the dynamics of grieving process and impact of bereavement on individuals/families, examine various determinants of loss and issues of complicated grief, and identify strengths-based clinical interventions.

276 AFRICAN AMERICAN WOMEN'S HEALTH ISSUES (3). Explores selected health issues confronting African American women and identifies race, gender, and class variables which impact health.

277 ALCOHOL, TOBACCO, AND OTHER DRUGS (ATOD): CLINICAL PRACTICE (3). Prerequisite or corequisite, SOWO 252. Students develop knowledge, skills, and attitudes specific to substance use, abuse, and dependency in order to work effectively in a variety of clinical settings with clients experiencing substance-related problems.

278 ALCOHOL, TOBACCO, AND OTHER DRUGS (ATOD): BIOMEDICAL BASIS (3). Prerequisite or corequisite, SOWO 252. This course covers biomedical basis of substance related disorders. Students will develop a broad scientific perspective on different classes of substances of abuse and biological basis of substance dependence.

281 SOCIAL WORK AND THE LAW (3). Course provides familiarity with legal processes, legal research, and legal analysis within the context of socio-legal issues important to social work practice.

282 THE NATURE, DYNAMICS, AND TREATMENT OF FAMILY VIOLENCE (3). Prerequisite, SOWO 227, equivalent course, or permission of instructor. This course provides an in-depth analysis of the etiology, effects, and dynamics of family violence as well as the identification of appropriate assessment and treatment strategies.

283 CARE OF THE DYING AND BEREAVED (3). Prerequisite, SOWO 227, equivalent course, or permission of instructor. This interdisciplinary clinical course addresses issues and practice models relating to terminal illness and bereavement faced throughout the life span. Co-taught by social work and nursing faculty.

284 ETHICAL DECISION MAKING IN SOCIAL WORK PRACTICE (3). A study of ethical decision making, along with potential guidelines for resolving dilemmas, and an in-depth examination of current illustrative practice issues.

292 EVALUATION OF SOCIAL INTERVENTIONS (3). Prerequisite, SOWO 102. Students develop knowledge of the purposes of evaluation research and the approaches and methodologies necessary to evaluate social work interventions.

304 THE ANALYSIS AND PRESENTATION OF DATA (3). Prerequisite, SOWO 102 or equivalent. Designed to explore basic principles and to provide advanced instruction in data analysis, including the construction and analysis of tables, statistical tests, and introduction to the use of computer programs.
Additional electives and independent study available for masters and doctoral students in any given semester:

320 Individualized Field Practicum (1-6). (Field fee $300).

330 Seminar in Human Behavior and Social Environment (1-6).

Human Sexuality and Sexual Identities (3). This graduate seminar practice elective addresses a wide range of topics in human sexuality. Students work with the professor to determine the focus and direction of this course, using current technology to identify and incorporate useful information about human sexuality for the class.

340 Seminar in Direct Practice (1-6).

350 Seminar in Specialized Practice (1-6).

350 Child Welfare Perspectives and Practices (1). Students gain knowledge necessary to be effective and successful in public child welfare. They are introduced to the perspectives of practitioners, managers, and consumers, and they practice oral and written skills required in child welfare. The continuation course is SOWO 382.

360 Seminar in Social Policy (1-6).

370 Seminar in Macro Practice (1-6).

370 Supervision and Consultation (3). Supervisory, administrative, supportive, and educational functions in a range of social work settings are presented. Knowledge and skills for a new supervisor are emphasized.

380 Special Topics in Social Work (1-6).

380 Rural Health: An Interdisciplinary Approach (3). This multidisciplinary course in health, pharmacy, dentistry, and social work provides knowledge base and forum for discussing issues in rural health. Provides training in problem solving by means of an interdisciplinary team approach.

381 Special Topics in Human Behavior and Social Environment (1-6).

381 Alcohol, Tobacco, and Other Drugs (ATOD): Social Work Practice with Culturally Diverse Populations (3). Prerequisite or corequisite, SOWO 252. Provides an overview of the problems and needs of diverse populations who misuse ATOD. Emphasis is on the development of culturally sensitive intervention strategies.

382 Special Topics in Practice (1-6).

382 Child Welfare Perspectives and Practices (2). Prerequisite or corequisite, SOWO 350. Students gain knowledge necessary to be effective and successful in public child welfare. They are introduced to the perspectives of practitioners, managers, and consumers, and they practice oral and written skills required in child welfare.

382.2 Clinical Practice with Families (3). Prerequisite, SOWO 227. This advanced practice course is devoted to intervention with families. Intervention methods will be applied to families coping with major life stressors and relational problems. Family therapy models are covered.

383 Special Topics in Policy (1-6).

384 Special Topics in Research (1-6).

385 Special Topics in Aging (1-6).

386 Special Topics in Family and Children (1-6).

387 Special Topics in Health (1-6).

388 Special Topics in Mental Health (1-6).

389 Special Topics in Human Services Administration (1-6).

390 Seminar in Research (1-6).

604 Aging and Health (DENT 604, PHPR 604, NURS 604, HMSCI 604, FMME 480, MEDI 480, PSYCHOLOGY, SOCIOLOGY) (3). Introduction to normal aging, diseases of aging, mental health issues, and use of health services by older adults.

701 Social Welfare Policy Analysis (PLCY 701) (3). Review of developments in U.S. welfare policy and economics, social and political forces underlying reform initiatives since the 1960s. Analysis of data on impacts of welfare policies and programs.

702 Financial Management of Nonprofit Organizations (PADM 702) (3). Prerequisite, SOWO 224, equivalent course, or permission of instructor. Provides basic financial skills for leaders of nonprofits, including bookkeeping fundamentals, interpreting financial statements, budgeting, cash management and investment, and legal compliance.

Ph.D. Courses

301 Foundations for Theory Construction (3). A critical and historical understanding of social work knowledge, values, and intervention provides students with a foundation for theory construction.

303 Research Methods in Social Intervention (3). Prerequisites, SOWO 102 and 304 or equivalent. An introduction to the basic principles of research for planning and evaluating social interventions. Topics include problem formulation, design, measurement, analysis, and the application of findings to theory and practice.

305 Research Practicum I (3). Prerequisite, SOWO 304. Students develop independent research competence through work on a research project under the direction of an experienced researcher.

309 Teaching Seminar (1). This seminar examines the role and structure of social work education at the BSW, MSW, and Ph.D. levels, and emphasizes curriculum development, educational design, and instructional delivery.

312 Development of Social Intervention Models (3). Prerequisites, SOWO 301, SOWO 302. A systematic approach to the design, implementation, and evaluation of social interventions provides the framework for developing models that address a range of social issues and needs.

313 Advanced Research Methods in Social Intervention (3). Prerequisites, SOWO 301, SOWO 302, SOWO 311, SOWO 312. Students build advanced competence in research design, data collection, data analysis, and statistics, by analyzing exemplary social work research and presenting independent learning projects within specialized areas of study.

314 Measurement in Social Intervention Research (3). Prerequisites, SOWO 303, SOWO 304. Course deals with quantitative and qualitative measurement strategies. Readings focus on theoretical and conceptual foundations of qualitative and quantitative measurement. Students develop skill through two field studies.

315 Research Practicum II (Var.). Continuation of Research Practicum I. (On request.)

319 Teaching Practicum (2). This practicum provides a range of supervised classroom or training opportunities designed to prepare advanced doctoral students for faculty positions in undergraduate and graduate level social work education.

394 Doctoral Dissertation (Var.). Dissertation work. (On request.)

Department of Sociology
RACHEL A. ROSENFELD, Chair

Professors
Howard E. Aldrich (42) Formal Organizations, Race and Ethnic Relations, Inequality, Evolutionary Theory, Social Networks
The Department of Sociology offers the Master of Arts and Doctor of Philosophy degrees in Sociology. Students receive training that equips them for careers in both teaching and research. All sociology students take basic work in sociological theory, research methods and statistics, and substantive areas. The program emphasizes balanced training and the integration of theory, method, and substantive knowledge. Detailed information on graduate degree procedures is online at www.unc.edu/depts/soc. For further information, including information about financial aid for students, contact the department’s administrative assistant for Student Services.

The department’s main concentrations of faculty research interest and graduate training are in comparative social organization and societal change, demography, research methods and social statistics, labor force and industrial relations, stratification and complex organizations.

A large proportion of first-year, as well as more advanced, students receive financial assistance. Sources of aid include teaching assistantships, research assistantships, and non-service fellowships.

The department works closely with the Carolina Population Center, the Odum Institute for Research in Social Science, and the University Computer Laboratory for training and research. Computer programming assistance, consultation, and computing services are available without charge for student research. The department sponsors and edits Social Forces, a national sociological journal.

Courses for Graduates and Advanced Undergraduates

110 FORMAL ORGANIZATIONS AND BUREAUCRACY (3). Varieties of organizational forms, their structures and processes; creation, persistence, transformation, and demise of organizational forms; role of organizations in contemporary society. Aldrich, Nielsen, J. Blau, Ruesf.

111 SOCIAL MOVEMENTS AND COLLECTIVE BEHAVIOR (3). Study of nonroutine collective actions such as demonstrations, strikes, riots, social movements and revolutions, with an emphasis on recent and contemporary movements. Kurtzman, Nielsen, Oberschall.

112 SOCIAL STRATIFICATION (3). Analysis of social structure and stratification in terms of class, status, prestige, and rank. Attention to social roles of elites, professionals, the middle class, the working class, and to comparative topics. Aldrich, Mouw, Rosenfeld.

114 THE CITY AND URBANIZATION (3). The city as a social, spatial, and political-economic phenomenon in the modern world. Analysis of urban demographic trends, spatial characteristics, and economic functions. Substantive topics include segregation, social turmoil, unemployment, fiscal problems, suburbanization, and urban public policy. J. Blau.

115 ECONOMY AND SOCIETY (3). Examination of the structure and operation of institutions where economy and society intersect and interact, such as education, industrial organization, on-the-job training, labor markets, and professional associations. Emphasis on the contemporary United States, with selected comparisons with other countries. Mouw, Oberschall.

118 COMPARATIVE EUROPEAN SOCIETIES (Political Science 114) (3). Examination of commonalities and differences of European societies and of the tensions and difficulties attending the European integration process. Nielsen, Marks.

120 POLITICAL SOCIOLOGY (3). Analysis of the reciprocal influences of state and social organizations upon each other; the social bases of political authority and stability of revolution and counterrevolution. Perrin, staff.

121 RELIGION AND SOCIETY (Religion 190) (3). Sociological analysis of group beliefs and practices—both traditionally religious and secular—through which fundamental life experiences are given coherence and meaning. Cramer, Smith, staff.
122 SOCIOLOGY OF HEALTH AND MENTAL ILLNESS (3). Course examines uniqueness of the sociological perspective in understanding mental health and illness. It draws upon various fields to explain mental illness in an broad a social context as possible. Attention focuses on how social factors influence definitions and perceptions of illness. Henderson, Ruff, staff.

123 SOCIOLOGY OF EDUCATION (3). A study of theory and research on the educational institution, with emphasis upon the multiple and changing effects of formal education in industrial societies. Tyson.

124 LAW AND SOCIETY (3). An analysis of the interconnections between law and society. Topics may include definitions and origins of law, legal institutions, dispute resolution, legal impact, and the role of law in social change. Staff.


127 THE LABOR FORCE (3). Supply and characteristics of labor and of jobs, including industrial and occupational changes, education and mobility of labor, and changing demography of the workforce. Kalleberg, Rosenfeld, J. Blau.

129 RACE, CLASS, AND GENDER (Women's Studies 129) (3). Conceptualizations of gender, race, and class and how, separately and in combination, they are interpreted by the wider society. Emphasis on how black and working-class women make sense of their experiences at work and within the family. Kleinman, Rosenfeld.

131 AGING (3). The process of aging from birth to death, with a concentration on the later years of life, examined from a broad perspective. Topics include individual change over the life-course, the social context of aging, and the aging of American society. Uhlenberg.

141 SOCIAL EVOLUTION (3). Examines how people initiate, continue, and end stigmatized behavior; social construction of deviant categories, identities, and careers; the social psychology of labeling deviants. Staff.

143 CONFLICT AND BARGAINING (Peace, War, and Defense 143) (3). Conflict and conflict-resolution behavior. Application to labor-management relations, family, sports, community politics, international relations. Cramer.

145 SOCIOLOGY OF EMOTIONS (3). The course examines how emotions are organized within social groupings and institutions. Differences in socialization by gender, ethnicity, social class, and age are explored. Kleinman.

150 THEORY AND PROBLEMS OF DEVELOPING SOCIETIES (3). Theories concerning the development process (motivational versus institutional, economic versus political and social development; similarity of sequential stages and outcomes) are related to policy problems facing the developing nations. Bollen, Oberschall.

153 SOCIAL CHANGE IN LATIN AMERICA (3). Introduction to Latin American ideologies and values; economic and demographic changes; major pressure groups (old elites, entrepreneurs, peasants and working classes, military and intellectuals); and relations with the United States. Smith.


168 U.S. POVERTY AND PUBLIC POLICY (3). This course examines issues of poverty and social policy, focusing on the urban underclass, child poverty, single-mother families, the welfare debate, and homelessness, and includes a service-learning component. Fall. Harris.

169 MEDICINE IN THE TWENTIETH CENTURY: HEALTH, PHYSICIANS AND SOCIETY (3). The primary objective of the course is to explain why particular social arrangements affect the types and distribution of diseases and how the medical care system is organized and responds. The course will focus on three topics: social factors in disease and illness; health care practitioners and their patients; and the changing face of the health care system. Staff.

171 URBAN PUBLIC POLICY (PUPA 171) (3). Defining and clarifying urban concerns and policies; emphasis on programs to revitalize cities. Issues include migration of people and jobs, housing, unemployment, poverty, crime, fiscal strain, linkages among settlement patterns, economic development strategies, energy and environmental objectives. Staff.

175 METHODS FOR POLICY ANALYSIS AND EVALUATION (Political Science 175, Public Policy Analysis 175) (3). Prerequisite, one semester of statistics. Introduction to selected techniques such as multiple regression, decision theory, research design, experiments and quasi-experiments, and program evaluation, as well as policy-related models. Lowery, staff.

199 SOCIOLOGICAL ANALYSIS: SPECIAL TOPICS (3). Examines selected topics from a sociological perspective. Course description for a particular semester is available in the departmental office. Staff.

Courses for Graduates

200 HISTORY OF SOCIAL THOUGHT (3). Prerequisite, graduate standing in sociology or written permission of the instructor. Historically social ideas of Western culture considered against a background of general cultural analysis in terms of systematic theory. Required of all graduate degree candidates in Sociology. Kurtzman.

202 MAJOR SOCIOLOGICAL THEORIES (2-3). Examination of selected writings, concepts, and issues of some major sociological theory or theoretical approach. Staff.

203 CURRENT ISSUES IN SOCIAL THEORY (3). An examination of selected recent work of general significance in sociology. Themes vary. Kurtzman.

204 PRINCIPLES OF THEORIZING (3). This course in metatheory analyzes methods of theorizing. It examines the criteria for constructing and evaluating scientific theories developed by philosophers of science and applies them to social theorizing. The hypothetico-deductive model of theorizing is contrasted with other theoretical approaches. Staff.

205 MACROSOCIOLOGICAL THEORY (3). The objective of the course is to illustrate three aspects of macrosociological theory: (1) the conception of macrosociology; (2) the structural approach in sociology; (3) hypothetico-deductive theorizing. A hypothetico-deductive macrostructural theory developed by the instructor is analyzed, and extensive empirical tests of the theory are presented. Staff.

207 MEASUREMENT AND DATA COLLECTION (Political Science 207) (3). Provides an introduction to measurement theory and a review of various methods of data-gathering. Gaining experience with a variety of techniques of measurement and preparing a pretended research proposal are required for all students. Entwistle.

208 STATISTICS FOR SOCIOLOGISTS (3). Provides an introduction to probability theory, descriptive statistics, inferential statistics, and the algebra of expectations. Emphasis is on elements useful to research sociologists including bivariate regression and correlation. Rosenfeld, Nielsen.

209 LINEAR REGRESSION MODELS (Health Policy and Administration 332) (3). The course presents regression analysis and related techniques. The major topics are: the assumptions of the regression model, dummy variables and interaction terms, outlier diagnostics, multcollinearity, specification error, heteroscedasticity, and autocorrelation. The final section introduces path analysis, recursive models, and nonrecursive systems. Bollen, Guo, Nielsen.

211 ANALYSIS OF CATEGORICAL DATA (Health Policy and Administration 335) (1-3). Prerequisite, permission of the instructor. Introduction to techniques and programs for analyzing categorical variables and nonlinear models. Special attention is given to decomposition of complex contingency tables, discriminant function analysis, Markov chains, and nonmetric multidimensional scaling. Bollen, Guo.
212 DEMOGRAPHY: THEORY, SUBSTANCE, TECHNIQUES, PART I (3). A basic introduction to the discipline of demography. Materials covered include: population history; data sources; mortality and fertility trends and differentials and techniques of analysis. Rindfuss, Uhlenberg, Entwisle, Harris.

213 DEMOGRAPHY: THEORY, SUBSTANCE, TECHNIQUES, PART II (3). A continuation of Sociology 212. Materials covered include: population growth, stable population theory; migration and distribution; population policy; population estimates and projections. Rindfuss, Uhlenberg, Entwisle, Mouw.


215 EVOLUTIONARY THEORY (3). Introduction to the new evolutionary theory and associated research. Oberschall.

217 SOCIAL PSYCHOLOGICAL THEORY (3). Introduction to basic theoretical approaches in social psychology, including social learning, social exchange, symbolic interaction, cognitive consistency, and affect control. Kleinman.

218 HUMAN ECOLOGY (3). Examination of how human populations adapt to their environments. Emphasis on linkages among population, organization, environment, and technology. Research applications of this approach to urban communities and organizations. J. Blau, Niehen.

220 INFLUENTIAL WORKS IN DEMOCRACY (Political Science 268) (3). The course covers the major traditions of democratic theory from ancient Greece to the present, including political organization, and nineteenth- and twentieth-century observations on democracy. Bollen, staff.

221 COMPARATIVE WELFARE STATES (Political Science 202) (3). This course examines the development, achievements, present crisis, and future of welfare states in advanced industrial democracies. Stephens.

223 SOCIAL ATTITUDES (3). Basic theories and methods in attitude research with special attention to attitude dynamics and social relations. Staff.

229 SOCIAL STRUCTURE AND PERSONALITY (3). The generic processes by which individuals become members of a society, with emphasis on the influence of social structure on socialization and the patterning of personality. Elders, Kleinman.

230 SOCIAL STRATIFICATION (3). Prerequisite, Sociology 120 or equivalent. Analysis of major theories of and approaches to the study of social inequality, with attention to how the various theories and approaches are operationalized. Focus on recent research in labor markets and world-wide inequality. Mouw, Niehen, Rosenfeld.

231 SOCIOLOGY OF GENDER (Women’s Studies 231) (3). Review theory on variation in men’s and women’s gender roles, with emphasis on industrialized societies and women’s roles. Rosenfeld, Udry.

232 JUSTICE AND INEQUALITY: SELECTED TOPICS (Var.). Prerequisite, permission of instructor. Examination of selected issues regarding societal, economic and political inequality and questions of justice in the United States and Western Europe. Staff.

234 SOCIAL MOVEMENTS (3). The structure and dynamics of social movements and their societal environment, with special reference to sociopolitical movements of minority and low status groups in industrialized and third world societies. Kurzman, Niehen, Oberschall, Smith.

245 SOCIOLOGY OF ORGANIZATIONS (3). Prerequisite, permission of the instructor. Structural features of organizations. Behavior in organizations. Organizational career patterns. Comparative analysis of structure, behavior, and careers in different types of organizations. Interorganization and organization—environment relations. Aldrich.

246 OCCUPATIONS AND WORK (3). The changing occupational system. Structural types of labor markets. Occupational organization, role sets, power relations, careers, and satisfaction in different types of labor markets and occupations. Kalieberg.

247 THE SOCIOLOGY OF SCIENCE: SCIENCE AS A SOCIAL AND CULTURAL ACTIVITY (3). This course examines the production of scientific knowledge. The focus is on the processes by which scientific knowledge and technological artifacts are constructed through cultural practices and the organizational of scientific work. Staff.

248 MEDICAL SOCIOLOGY: HEALTH, ILLNESS, AND HEALING (3). This graduate seminar presents a conceptual and substantive overview of some of the main historical and political issues in the field of medical sociology. The focus of the course is on continuity and change in health and health care. The following topics will be examined: social causation of disease; medicalization of social problems; medicine as a profession; treatment systems and organization of care; politics and the changing face of the medical care system. Staff.

253 EXPERIMENTAL DESIGN IN SOCIOLOGY (3). Prerequisite, permission of the instructor. Statistical aspects of experimental designs with emphasis on applied problems involved in executing a statistically sound design. (On demand.) Staff.

254 SURVEY SAMPLING (3). Prerequisite, permission of the instructor. The different sampling techniques are discussed. Major emphasis on planning of large-scale sample surveys rather than on statistical theory. (On demand.) Staff.


263 SOCIAL GERONTOLOGY (3). Prerequisite, permission of the instructor. The study of the aged in our society. Uhlenberg.

265 CIVIL SOCIETY (1-3). Under the conditions of globalization, civil society takes on new and different meanings. Course examines what the term means and how it is applied.

266 SOCIOLOGY OF CULTURE (3). Focuses on substantive and theoretical issues in this field and their intellectual origins. Topics include organizations, art, religion, science, class, and politics. Quantitative and qualitative approaches are examined. J. Blau, Smith.

267 SOCIOLOGY OF RELIGION (3). An introductory, graduate-level survey of the sociology of religion as a field of study, reviewing literature on important theoretical approaches and key problems and issues in the field. Fall. Smith.

268 ETHNICITY, RACE, AND EDUCATION (Var.). Emerging new theory and research paradigms in the sociology of education are reviewed. The course covers the following: racial and ethnic variation, parenting, contextual variation, peer influence, and school variation. J. Blau, Tyson.

270 THE LIFE COURSE (3). Provides an intense introduction to the life course as a theoretical orientation and methodology (logic of inquiry). Elder.

274 SEMINAR IN URBAN SOCIOLOGY (3). Theory and research in the study of the location and growth of urban areas, the effect urban areas have upon behavior, and the study of social behavior in different urban subareas. Each member of the seminar completes a project interrelating theory and research. Staff.

280 SOCIOLOGICAL THEORIES OF AGING AND THE ADULT LIFE COURSE (3). Overview and critical assessment of sociological theory applied to aging, including explicit theories of aging. The course examines historical development of the field, and considers the nature of theory development. Marshall.

287 MIGRATION AND POPULATION DISTRIBUTION (3). Treats migration trends, patterns, and differentials and their effects on population distribution in continental and regional areas. Attention is given to theoretical and methodological problems in the study of population movement. (On demand.) Uhlenberg.

289 SOCIOECONOMIC FACTORS IN FERTILITY (3). Fertility differentials by social and economic factors, changes therein over time, the manner in which these factors affect fertility, and the implications thereof for fertility-control programs are studied. (On demand.) Rindfuss, Entwisle.
300 TRAINING PROGRAM SEMINARS (1). Continuing seminars in selected topics. Staff.

301 READING AND RESEARCH (Var. 1-3) (3 each semester). Registration by permission of the instructor.

302, 303 ADVANCED READING. Library research or field research on a selected topic under guidance of the instructor. Staff.

307 SEMINAR ON POLICY ANALYSIS (3). Common normative, political, and behavior aspects of policy choice in diverse fields: e.g., urban, education, health, welfare, population, and foreign policy. Public policies may modify or replace the market. MacRae.

308 SEMINAR IN COMPARATIVE AND HISTORICAL SOCIOLOGY (3). Prerequisite, permission of the instructor. Examination of issues involved in societal comparison, with an emphasis upon comparative and historical analysis of substantive issues at the macro-societal level. Special attention is given to methodological problems. Kurzman.

311 SEMINAR IN POLITICAL SOCIOLOGY (Political Science 311) (3). The relationships between social structure and political decisions. Regimes and social structure: bureaucracies, political associations, and professions; science and politics; closed and open politics; political movements and change. Kurzman, Stephens.

312 SEMINAR ON SOCIAL NETWORKS (3). Prerequisite, permission of the instructor. Theoretical and substantive issues in social network analysis. Focus is on models of social structure. Staff.

314 SEMINAR IN SOCIAL CONTROL AND DEVIANCE (3). Registration by permission of the instructor. The relation of social norms to conforming and deviant behavior. Types of social and personal controls. Theoretical and research problems are reviewed. Staff.

315, 316 READING AND RESEARCH IN METHODOLOGY (3 each semester). Registration by permission of the instructor. Special work on selected problems of research methodology. Staff.

317 STRUCTURAL EQUATIONS WITH LATENT VARIABLES (Health Policy and Administration 336) (3). Prerequisites, Sociology 299 and permission of the instructor. This course examines models sometimes referred to as LISREL models. Topics include: path analysis, confirmatory factor analysis, measurement error, model identification, nonrecursive models, multiple indicators. Bollen.

318 LONGITUDINAL AND MULTILEVEL DATA ANALYSIS (3). Prerequisite, Sociology 209, 211, or equivalent. This course provides an introduction to event history analysis or survival analysis, random effects and fixed effects models for longitudinal data, multilevel models for linear and discrete multilevel data, and growth curve models. Bollen, Guo.

320 SYSTEMATIC METHODS OF QUALITATIVE RESEARCH (3). Course designed to teach methods of data collection and analysis for qualitative research. Kleinman, Smith, Tyson.

321 FIELD RESEARCH (3 each semester). Registration by permission of the instructor.

326 SEMINAR IN SELECTED TOPICS (3). Course description for particular semester is available in department office. Registration by permission of the instructor. Staff.

329 SEMINAR IN SOCIALIZATION AND GROUP PROCESS (3). Prerequisite, permission of the instructor. Analysis of theoretical issues and empirical research relevant to socialization. Special emphasis upon group process effects on the evolution of the social self, the "fit" between personality and role, and other issues. Kleinman.

333 SEMINAR IN MARRIAGE AND THE FAMILY (3). (On demand.) Ullenberg.

380 SEMINAR ON THE TEACHING OF SOCIOLOGY (3). Prerequisite, doctoral candidacy in sociology or permission of the instructor. Examines teacher's role and teaching process, planning a course, constructing syllabi, testing for teaching or grading, evaluating teacher performance, needs of different student populations. Aldrich.

393 MASTER'S THESIS (3 or more). Individual research in a selected field under the direction of a member of the department. Staff.

394 DOCTORAL DISSERTATION (3 or more). Individual research in a selected field under the direction of a member of the department. Staff.

**Interdisciplinary Courses for Advanced Undergraduates and Graduates**

**SOCI 604 AGING AND HEALTH** (Epidemiology 604, Psychology 604) (3). Sponsored by UNC-Chapel Hill's campus-wide Institute on Aging. The course provides students in all disciplines with a general background in aging and the problems of older persons. Staff.

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**DIVISION OF SPEECH AND HEARING SCIENCES**

**JACKSON ROUSH, Director**

**Professors**

- Elizabeth R. Cain (48) Language Development and Disorders in Infants, Toddlers, and Preschoolers; Working with Families in Early Intervention
- Lee McLean, Early Intervention and Language Development in Children
- Jackson Roush (59) Pediatric Audiology, Early Intervention

**Associate Professors**

- Melody F. Harrison (40) Speech, Language, and Communication Development in the Hearing Impaired; Auditory
- Robert Mayo (49) Craniofacial Anomalies, Adult Language Disorders, Voice Disorders
- James Montgomery (68) Psycholinguistics Language Disorders, Language/Learning Disabilities

**Assistant Professors**

- Katariina L. Haley, Speech Perception and Production, Neurogenic Communication Disorders

**Research Professors**

- Joseph W. Hall (53) Audiology and Psychoacoustics Research
- Robert W. Peters (9) Auditory and Speech Perception, Sensation and Perception, Stuttering
- Joanne E. Roberts (50) Early Language Development and Disorders, Otosis Media

**Research Associate Professor**

- John H. Gose, Audioloxy and Psychoacoustics Research

**Clinical Professor**

- Celia R. Hooper (53) Voice Disorders and Prevention, Adult Language Disorders, Counseling Skills in Allied Health, Communication and Aging

**Clinical Associate Professors**

- Bobbie B. Lubker (51) Language Development, Epidemiology of Communication Disorders
Linda R. Watson (67) Language Disorders in Young Children, Autism, Emerging Literacy

**Clinical Assistant Professors**
Connie Carson-Smith, Hearing Aids, Hearing Assistive Devices, Diagnostic Audiology, ENG
Brenda Mitchell, Adult Neurogenic Disorders, Community Re-entry for Adults, Clinical Supervision
Sharon S. Ringwald (42) Diagnostic Evaluations, Supervision, Ethics and Efficacy Issues
Stephanie Sjoblad, Aural Rehabilitation, Hearing Aids and Assistive Devices

**Clinical Instructors**
Debra Weleeder, Pediatric and Educational Audiology, Hearing Aids
Lisa Domby (visiting) Phonology, Speech-Language Pathology
Martha R. Mundy (70) Pediatric Audiology, Educational Audiology

**Adjunct Associate Professors**
Carolyn M. Mayo, Multicultural Issues, Adult Language Disorders, Prevention of Communication Disorders

**Adjunct Clinical Instructors**
Mark M. Haythorn, Diagnostic Audiology

**Adjunct Clinical Instructors**
Christine P. Burken, Neuromotor, Supervision
Carolyn Brown, Cochlear Implants in Children
Brian Kanakdiny, Dysphagia, Neurogenic Speech Disorders
Debra R. Reinhardt, Augmentative Communication, Clinical Supervision
Terry Tucker, American Sign Language, Cultural Aspects of the Deaf

The Division of Speech and Hearing Sciences in the Department of Allied Health Sciences, School of Medicine, provides academic and professional education for speech-language pathologists and audiologists at the master's and doctoral levels. The study of speech and hearing requires knowledge in both normal and abnormal speech, hearing, and language. The Speech and Hearing Sciences Curriculum provides an environment where learning can be based on laboratory and clinical experiences. Three major tracks of study are possible within the curriculum: Audiology, Speech-Language Pathology, and Speech and Hearing Sciences. There are three academic degree programs: 1) a master's degree (M.S.) for entry-level clinical practice of speech-language pathology, 2) a professional doctorate (Au.D.) for entry-level clinical practice in audiology (available fall, 2002), and 3) a Ph.D. in Speech and Hearing Sciences, for individuals with a background in speech-language pathology or audiology who desire a research degree emphasizing communication disorders in early childhood. The programs are interdisciplinary in that clinical and research activities of other University departments and institutions as well as the Division of Speech and Hearing Sciences are involved in the educational program.

The entrance, academic, and residence requirements correspond to those of the Graduate School. All students following professional tracks are prepared to meet licensure and certification requirements necessary for the practice of speech-language pathology or audiology. More complete information describing the graduate program can be obtained by writing to the Division of Speech and Hearing Sciences, CB# 7190, Department of Allied Health Sciences, School of Medicine, Website: www.med.edu/ahs/sphs.

**Courses for Graduates and Advanced Undergraduates**


140 SPEECH SCIENCE (Communication Studies 182) (3). Introduction to the science of speech, including production, acoustics, and perception. Fall. Haley.


**Courses for Graduates**

201 INTRODUCTION TO RESEARCH IN SPEECH AND HEARING (3). Prerequisite, statistics course. Experimental and descriptive research designs in speech and hearing sciences including both group and single subject. Spring. Montgomery, Haley.

203 AUDIOLOGIC REHABILITATION FOR CHILDREN (3). Prerequisite, Speech and Hearing Sciences 123. Covers speech perception and the effects of hearing loss on perception and production of speech as background for understanding assessment and treatment, with an auditory-verbal emphasis. Pediatric assessment and amplification are reviewed. Spring. Harrison.

204 AUDIOLOGIC REHABILITATION FOR ADULTS (3). Theoretical bases and history of audiologic rehabilitation of adults. Also, practical approaches to assessment and therapeutic intervention are presented. The roles of assistive technology and family-based counseling are included. Fall. Sjoblad.

205 SEMINAR IN ADVANCED AUDITORY VERBAL THERAPY (2). Prerequisites, SPHS 203, 221. Provides an advanced level of knowledge and skill in the auditory-verbal approach working with birth-5 year olds who have a hearing loss. Spring. Wilson, Harrison, Houston.

206 COMMUNICATION ASSESSMENT AND INTERVENTION WITH INFANTS AND TODDLERS (3). Stages of communication development of infants from birth to two years old, clinical issues related to the assessment and intervention and planning for infants and toddlers with disabilities and their families. Spring. Craig.

207 COMMUNICATION ASSESSMENT AND INTERVENTION WITH PRESCHOOLERS (3). Stages of communication development of two-to-five-year-olds, clinical and research issues related to the assessment and intervention of preschoolers with disability and their families. Fall. Watson.


220 AMERICAN SIGN LANGUAGE III (2). A course in finger spelling and sign language (ASL). Emphasis is placed on developing expressive and receptive interpreting skills. Historical and philosophical aspects of manual communication, and an introduction to Deaf culture are presented. Fall. Tucker.

221 PHYSIOLOGICAL AND PSYCHOLOGICAL BASES OF HEARING (3). Auditory function; anatomy and physiology of the auditory system; auditory processing at the psychoacoustic level. Fall. Gross.

223 AMERICAN SIGN LANGUAGE IV (1). Emphasis is placed on developing advanced skills in expressive and receptive interpreting. Continued study of Deaf culture, historical and philosophical aspects of manual communication. Spring. Tucker.

225 HEARING DISORDERS (2). Prerequisite, Speech and Hearing Sciences 123 or equivalent. Diseases and disorders of the auditory system and their management. Fall. Roush.

241 NEUROANATOMY (3). Prerequisite, Speech and Hearing Sciences 170 or equivalent. A survey of neurological anatomy in relation to clinical speech-language pathology. Topics considered include organization of the CNS, neuroanatomy, neurophysiology, and neurochemistry. Spring. Harrison.
263 LANGUAGE ASSESSMENT AND MANAGEMENT (3). Communication assessment and treatment for children from age birth through five and their families. Covers communication and related domains (e.g., play, cognition, social aspects). Fall. Craig.

264 LANGUAGE IMPAIRMENTS OF CHILDREN (3). Prerequisite, Speech and Hearing Sciences 263. Seminar course exploring categorical classifications of young children and the impact of these categories on assessment and intervention. Common topics include: autism, visual impairments, fragile X syndrome, Down syndrome. Spring. Watson, Craig.

265 AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (3). Prerequisite, Speech and Hearing Sciences 347 or equivalent. A comprehensive look at the theoretical and clinical issues related to augmentative/alternative communication. Techniques and strategies to provide effective communication for the severely handicapped are discussed. Spring. Sturm.

281 APPLIED PSYCHOLINGUISTICS (3). Broad course in theoretical and applied psycholinguistics designed to examine underlying cognitive processes related to language development, comprehension and production. Spring. Montgomery.

302 PROBLEMS IN SPEECH AND HEARING SCIENCES (1-3). May be repeated for credit. Fall, spring, and summer. Staff.

304 CLINICAL PRACTICUM IN SPEECH-LANGUAGE PATHOLOGY (1-3). Permission of practicum coordinator. Supervised clinical experience. May be repeated for credit. Fall, spring, summer. RongILT.

305 CLINICAL PRACTICUM OBSERVATION IN AUDIOLOGY (1-3). Prerequisite, Communication Studies 184 or equivalent. Supervised observation in clinical experience. May be repeated for credit. Fall, spring, summer. Roush.

306 CLINICAL PRACTICUM IN AUDIOLOGY (1-3). Prerequisite, permission of practicum coordinator. Supervised clinical experience. May be repeated for credit. Fall, spring, summer. Carlson-Smith.

310 AUDIOLOGIC EVALUATION I (3). Prerequisite, Speech and Hearing Sciences 123 or equivalent. Clinical audiologic techniques including speech audiometry and special auditory tests. Masking is covered in depth, as well as consolidation of clinical skills for diagnostic and rehabilitative purposes. Fall. Mundy, Roush.

311 AUDIOLOGIC EVALUATION II (3). Prerequisite, Speech and Hearing Sciences 310 or equivalent. Clinical audiologic techniques including special auditory tests for psychoacoustics, central auditory processing, and pediatric audiology. Spring. Roush.

312 CHARACTERISTICS OFAMPLIFICATION SYSTEMS (3). Amplification options for the hearing-impaired; specifically, hearing aid, electroacoustics, and earmold technologies. Additionally, pre-hearing aid selection procedures are presented. Fall. Weintleder.

313 FITTING AND DISPENSING OR AMPLIFICATION SYSTEMS (3). Prerequisite, Speech and Hearing Sciences 312 or equivalent. Theoretical and practical approaches to fitting amplification systems and the procedures for dispensing amplification systems to the hearing-impaired. Spring. Carlson-Smith.

314 ELECTROPHYSIOLOGIC AUDIOMETRY (3). Prerequisites, Speech and Hearing Sciences 221, Speech and Hearing Sciences 310. This course explores the field of electrophysiologic responses within the auditory and vestibular systems. Auditory brainstem response (ABR), electrocochleography (ECoG), electroencephalography (EEG), and otoacoustic emissions (OAE) are covered. Spring. Grose.


316 INDUSTRIAL AUDIOLOGY AND HEARING CONSERVATION (2). Prerequisite, Speech and Hearing Sciences 123 or equivalent. Military and industrial audiology and hearing conservation, including physiological and psychological factors. Fall. Royter.

317 PROFESSIONAL CONSIDERATIONS IN SPEECH AND HEARING (3). To provide the graduate major with information about current issues facing professionals. These include changing delivery systems, leadership, treatment efficacy and quality, reimbursement, and ethics. Fall. Ringbilt.

318 ELECTRONYSTAGMOGRAPHY AND VESTIBULAR ASSESSMENT (2). Principles of vestibular function and dysfunction, clinical application of ENG. Fall. Carlson-Smith.

321 SEMINAR IN AUDIOLOGY (1-3). Special topics and significant literature in the field of audiology. (On demand.) Staff.

330 INDEPENDENT STUDY (1-6). This course gives enrolled graduate students in the curriculum an opportunity to pursue research supervised by one or more faculty members culminating in a written document or special project. Fall, spring, and summer. Staff.

331 SEMINAR IN SPEECH-LANGUAGE PATHOLOGY (3). Special topics and significant literature in the field of speech pathology. (On demand.) Staff.

342 ADULT APHASIA (3). Prerequisite, Speech and Hearing Sciences 170 or equivalent. Discussion of adult aphasia and its clinical management, including assessment, diagnosis, prognosis, counseling, and treatment. Combined lectures and laboratories. Spring. Haley.

343 PHONOLOGICAL DEVIATIONS: ASSESSMENT AND MANAGEMENT (3). Prerequisites, Speech and Hearing Sciences 130, Speech and Hearing Sciences 170. Course deals specifically with major diagnostic tests of articulation and the specific management programs associated with each. Thorough examination of the research supporting these tests and treatment plan is included. Fall. Craig.


345 PRINCIPLES OF DIAGNOSIS AND INTERVENTION (3). Diagnostic procedures focusing on interviewing, counseling, report writing and standard measures. Intervention procedures focusing on establishing goals, criteria for success, documentation of progress, discharge planning, and therapy strategies. Fall. Harrison, Robinson.

346 STUTTERING (2). Prerequisite, Speech and Hearing Sciences 170. Major theories, treatment, identification, and diagnosis with respect to child and adult stuttering. Summer. Mayo.


348 VOICE DISORDERS (3). Prerequisites, Speech and Hearing Sciences 140, Speech and Hearing Sciences 170. Assessment and management of children and adults with voice disorders and laryngectomy. Fall. Hooper.

349 EVALUATION AND CLINICAL MANAGEMENT OF PERSONS WITH ORAL-FACIAL ANOMALIES (3). Prerequisites, Speech and Hearing Sciences 140, Speech and Hearing Sciences 170. In-depth study of the embryologic and physiologic bases of oral-facial anomalies and the team approach to assessment and habilitation. Particular emphasis placed upon the following specialties: genetics, plastic surgery, prosthodontics, orthodontics, osteosynrgology, and speech-language pathology. Fall. Mayo.

350 THE COMPUTER AS A RESEARCH TOOL (3). This course explores the use of computers in research and clinical practice for speech-language pathologists and audiologists. Summer. Roush, Hooper.
352 COGNITIVE LINGUISTIC PROCESSING DISORDERS IN ADULTS
(3). Prerequisite, Speech and Hearing Sciences 342 or equivalent. Discussion of normal aging and language. Assessment and treatment of cognitive and linguistic problems in persons with dementing conditions, right hemisphere dysfunction, and traumatic brain injury. Spring. Haley, Hooper.

354 DYSPHAGIA (3). Prerequisite, Speech and Hearing Sciences 342. Discussion of the development of the normal swallow, anatomy and physiology of the swallowing mechanism, and assessment and team management of swallowing disorders. Spring. Mutchler, Brackett, Kanapley.

361 SEMINAR IN LANGUAGE AND LANGUAGE DISORDERS (1-3). May be repeated for credit. Special topics and significant literature in the field of language and language disorders. (On demand.) Staff.

362 LANGUAGE AND LEARNING DISORDERS (3). Prerequisite, Speech and Hearing Sciences 162 or equivalent. Course in normal and abnormal learning from a language perspective. Emphasis on evaluation and treatment from a psycholinguistic model. Fall. Montgomery.

381 SEMINAR IN HEARING SCIENCE (1-3). May be repeated for credit. Advanced special topics and current research in hearing science. (On demand.) Staff.

382 SEMINAR IN SPEECH SCIENCE (1-3). May be repeated for credit. Advanced special topics and current research in speech science. (On demand.) Staff.

383 SPEECH PATHOLOGY INSTRUMENTATION FOR CLINICAL EFFECTIVENESS (1). Prerequisite, Speech and Hearing Sciences 140. Practical experience in the use of instrumentation to assess the acoustic and physiological characteristics of speech and voice production. Use of these instruments for therapeutic intervention. Spring. Hooper, Mayo.

393 MASTER'S THESIS (3 or more). Full, spring, and summer. Staff.

DEPARTMENT OF STATISTICS
RICHARD L. SMITH, Chair

Professors
Edward Carlstein (25) Stochastic Processes, Nonparametric Inference
Indra M. Chakravarti (3) Design of Experiments, Combinatorics, Information and Coding Theory
Jianqing Fan (27) Nonparametric Functional Estimation, Statistical Inference
Gopinath Kallianpur (20) Statistics, Probability and Stochastic Processes, Filtering and Control Theory
Alan F. Karr (30) Inference for Stochastic Processes, Image Analysis, Engineering Application of Statistics
Douglas G. Kelly (6) Probability, Combinatorics, Biological Applications
Malcolm Ross Leadbetter (7) Probability, Stochastic Processes
James Stephen Marron (24) Nonparametric Inference, Asymptotic Theory
Pranab Kumar Sen (22) Nonparametric Methods, Multivariate Analysis, Sequential Analysis
Gordon D. Simons (8) Statistical Inference, Probability

Associate Professors
Chuanhu Ji (26) Statistical Modeling and Computing in Materials Science, Image Analysis, and Quantitative Finance
Andrew Nobel (32) Nonparametric Statistics, Pattern Recognition

Assistant Professor
Anarjit Budhiraja (36) Probability and Stochastic Processes, Stochastic Control and Filtering, Large Deviations, Stochastic Networks

Adjunct Professors
Robert J. Adler (2) Stochastic Processes, Random Fields

Kenneth A. Bollen (34) Comparative Political Structures, Statistics, International Development
A. Ronald Gallant (31) Econometrics, Nonlinear Models, Non-parametric Inference
Harry L. Hud (33) Stochastic Processes, Statistical Inference
Valen Johnson (35) Image Analysis, Bayesian Statistics, Binary Data
Robert Rodriguez (19) Statistical Quality Improvement, Statistical Graphics

Professors Emeriti
Charles R. Baker
Norman L. Johnson
Walter L. Smith

Courses for Graduate Students Not Majoring in Statistics
The Department of Statistics offers a variety of courses of potential value to students majoring in other disciplines. The basic ideas of statistics are taught in Statistics 101 and 102. Somewhat more theoretical and mathematical than 101 and 102 are Statistics 126 and 127.

Several of the department's other courses may be suitable for students from other departments. Interested students should contact the director of Graduate Studies or see the department's webpage at www.stat.unc.edu.

Graduate Program in Statistics
The Department of Statistics offers both M.S. and Ph.D. programs in Statistics. Students who plan to teach statistics or to engage in research of any kind should work for the degree of Doctor of Philosophy. This requires at least three years of full-time graduate work, predicated upon substantial undergraduate mathematical preparation. Research is an important part of the work for the doctorate. Those interested in obtaining an understanding of the fundamental notions of statistical theory and practice are directed to the Master of Science degree program. This degree may be obtained with or without writing a thesis, and normally requires four semesters for completion.

Doctoral students without an M.S. degree in Statistics complete the M.S. program without delaying their Ph.D. work.

The philosophy of the department is that its Ph.D. graduates should be broadly based in statistical theory and practice, and at the same time be able to conduct basic research in some special area. Students in the first year typically take Statistics 154-5, 164-5, and 174-5, and possibly other courses chosen from 184-5 and 194-5. In the second and third years students taking advanced courses may specialize in an area of interest. Students may also take courses offered by other departments such as the departments of Biostatistics, Mathematics, and Operations Research, on the Chapel Hill campus, and by various departments of North Carolina State University in Raleigh and of Duke University in Durham.

The department is located in New West building. A departmental network of Sun Spark stations provides the opportunity for advanced computing in a Unix environment. All graduate students in the department have access to this network, as well as to the University's computing system, through desktop IBM PCs which are situated in every graduate student office. The Mathematics-Physics-Statistics Library, located in nearby Phillips Hall, maintains an extensive collection of books and journals pertaining to statistics.

The department's Colloquium meets three times per month during the academic year; speakers include visitors from other universities and research institutions. The graduate curriculum in the Department of Statistics places strong emphasis on the mathematical theory of probability and statistics. A sound mathematical preparation is thus an essential prerequisite for admission to the department. An applicant's mathematical background should include a one-year course in advanced (multivariable) calculus or real analysis, at least one semester in matrix algebra, and calculus-based courses in probability and statistics.
Application forms for admission and/or financial aid may be obtained by writing to either the Graduate School or to the Department of Statistics.

On-line application is also available through the Graduate School's website at gradschool.unc.edu. Applicants are required to submit scores for both the Aptitude and Advanced Mathematics portions of the Graduate Record Examinations in support of their application, and a supplementary sheet providing brief course descriptions, including test title where applicable, or previous undergraduate and graduate courses in mathematics and statistics.

Applicants for financial aid are considered for assistantships within the department and also for various fellowships and limited service awards provided on a competitive University-wide basis by the Graduate School.

Assistants perform academically related duties, such as teaching and assisting instructors. Other awards include merit assistantships, University Graduate and Alumni Fellowships, George E. Nicholson Jr. Fellowships, Noyce Fellowships, and Morehead Fellowships. Stipends range from $10,000 to $14,000 for the academic year, with tuition included with fellowship awards.

Application for admission and financial aid may be made simultaneously simply by indicating on the admission application form a desire to be considered for financial aid.

More detailed information about the Department of Statistics is available on the Web at www.stat.unc.edu. Specific inquiries should be addressed to the director of Graduate Admissions, Department of Statistics, CB# 3260, Chapel Hill, NC 27599-3260.

Courses for Graduates and Advanced Undergraduates

101 STATISTICAL METHODS I (3). Prerequisite, Statistics 31. Review of basic inference; 2-sample comparisons; correlation; introduction to matrices; simple and multiple regression (including significance tests, diagnostics, variable selection); analysis of variance; use of statistical software. Fall and spring. Fan, Marron, Smith, Nobel, Chakravarti.

102 STATISTICAL METHODS II (3). Prerequisites, Statistics 101 and Mathematics 147. Statistical computer packages. Topics selected from: design of experiments; sample surveys; nonparametric; time-series; multivariate analysis; contingency tables; logistic regression; simulation. Use of statistical software packages. Spring. Chakravarti, Fan, Marron, Nobel, Smith.

104 SAMPLE SURVEY METHODOLOGY (Biostatistics 164) (3). Prerequisite, Statistics 101 or equivalent. Fundamental principles and methods associated with survey sampling, giving primary attention to nonparametric as possible a treatment of simple random sampling, stratified sampling, and cluster sampling. Also, techniques of questionnaire design, the problems of nonresponse, and sources of nonsampling errors. Practical experience in the applied aspects of sampling is provided by student participation in the design, execution, and analysis of an actual survey. Spring. Kalsbeek.

126 INTRODUCTION TO PROBABILITY (Mathematics 146) (3). Prerequisite, Mathematics 33. Introduction to mathematical theory of probability covering random variables, moments, binomial, Poisson, normal and related distributions, generating functions, sums and sequences of random variables, and statistical applications. Fall and spring. Kelly, Nobel.

127 MATHEMATICAL STATISTICS (3). Prerequisite, Statistics 126 or equivalent. Functions of random samples and their probability distributions; introductory theory of point and interval estimation, and of hypothesis testing; elementary decision theory. Fall and spring. Carlstein, Kelly, Simons.

128 APPLIED MULTIVARIATE ANALYSIS I (Biostatistics 166) (3). Prerequisite, Biostatistics 165 or equivalent. Application of multivariate techniques, with emphasis on the use of computer programs. Multivariate analysis of variance, multivariate multiple regression, weighted least squares, principal component analysis, canonical correlation, and related techniques. Summer. Muller.

136 ACTUARIAL MATHEMATICS II (Mathematics 162) (3). Prerequisites, Mathematics 161, Statistics 126. The theory introduced in Actuarial Mathematics I is expanded to encompass more complex models of financial transactions and risks. Spring. Staff.

137 STOCHASTIC MODELS (3). Prerequisite, Statistics 126. Introduction to queuing theory (substantial), Markovian sequential decision process, inventory theory and topics from stochastic linear programming, simulations, scheduling, game theory. Applications. Staff.

152 METHODS OF MATHEMATICAL STATISTICS (3). Prerequisite, advanced calculus. Introductory treatment of special mathematical techniques of particular importance in probability and statistics, including complex variables. Fourier and Laplace transforms, elements of finite difference equations. Spring. Staff.

154 MEASURE AND INTEGRATION (3). Prerequisite, advanced calculus. Lebesgue and abstract measure and integration, convergence theorems, differentiation, Radon-Nikodym theorems, product measures, Fubini theorems, Lp spaces. Fall. Kallianpur, Leadbetter.


156 COMBINATORIAL MATHEMATICS (Mathematics 168) (3). Prerequisite, Math 81, or permission of the instructor. Recurrence relations and generating functions; graphs and graph algorithms; principle of inclusion-exclusion. Fall. Brylawski.


171 INTRODUCTION TO NONPARAMETRIC STATISTICS (Biostatistics 256) (3). Prerequisite, Biostatistics 160 or equivalent. Theory and application of nonparametric methods for various problems in statistical analysis. Includes procedures based on randomization, ranks, and U-statistics. A knowledge of elementary computer programming is assumed. Fall. Bangdiwa.

174 APPLIED STATISTICS I (3). Prerequisite, Statistics 127 or equivalent. Introduction to linear models and multiple regression; introduction to statistical computing; statistical data analysis and visualization. Fall. Smith, Marron, Fan.


184 STOCHASTIC PROCESSES (3). Prerequisite, Statistics 126 or equivalent. Discrete and continuous parameter Markov chains, Brownian motion, stationary processes. Fall. Leadbetter, Nobel, Ji.

185 TIME SERIES AND MULTIVARIATE ANALYSIS (3). Prerequisites, Statistics 126 and 127 or equivalents. Introduction to time series: exploratory analysis, time-domain analysis and ARMA models, Fourier analysis, state space analysis. Introduction to multivariate analysis: principal components, canonical correlation, classification and clustering, dimension reduction. Spring, alternate years. Leadbetter, Marron, Smith.
190 STATISTICAL CONSULTING (3, taught over two semesters). Application of statistics to real problems presented by researchers from the University and local companies and institutes. Fall, spring. Marron, Smith.

194 DESIGN AND ROBUSTNESS (3). Prerequisite, Statistics 127 or equivalent. Introduction to experimental design, including classical designs, industrial designs, optimality, and sequential designs. Introduction to robust statistical methods; bootstrap, cross-validation, and resampling. Fall, alternate years. Chakravarti, Cástañer, Marron.

195 BAYESIAN STATISTICS AND GENERALIZED LINEAR MODELS (3). Prerequisite, Statistics 127 or equivalent. Bayes factors, empirical Bayes theory, applications of generalized linear models. Spring. Staff.

Courses for Graduates

205 STATISTICAL QUALITY IMPROVEMENT (3). Prerequisites, Statistics 105, 165, 174 or equivalent. Methods for quality improvement through process control, graphical methods, designed experimentation. Shewhart charts, cusum schemes, methods for autocorrelated multivariate process data, process capability analysis, factorial and response surface designs, attribute sampling. Rodríguez.


221 SEQUENTIAL ANALYSIS (3). Prerequisites, Statistics 155 and 165, or equivalents. Hypothesis testing and estimation when sample size depends on the observations. Sequential probability ratio tests. Sequential design of experiments. Optimal stopping. Stochastic approximation. Simons.


224 STATISTICAL LARGE SAMPLE THEORY (3). Prerequisites, Statistics 132 and 135, or equivalents. Asymptotically efficient estimators; maximum likelihood estimators. Asymptotically optimal tests; likelihood ratio tests. Simons.


231 ADVANCED PROBABILITY (3). Prerequisites, Statistics 112 and 132, or equivalents. Advanced theoretic course, covering topics selected from: weak convergence theory, central limit theorems, laws of large numbers, stable laws, infinitely divisible laws, random walks, martingales. Kallianpur.

232 STOCHASTIC PROCESSES (3). Prerequisites, Statistics 112 and 132, or equivalents. Advanced theoretic course including topics selected from: foundations of stochastic processes, renewal processes, Markov processes, martingales, point processes. Staff.

233 TIME SERIES ANALYSIS (3). Prerequisites, Statistics 154 and 155, or equivalents. Analysis of time series data by means of particular models such as autoregressive and moving average schemes. Spectral theory for stationary processes and associated methods for inference. Stationarity testing. Ledbetter.

234 EXTREME VALUE THEORY (3). Prerequisites, Statistics 155 and 164, or equivalents. Classical asymptotic distributional theory for maxima and order statistics from i.i.d. sequences, including extremal types theorem, domains of attraction, Poisson properties of high level exceedances. Stationary stochastic sequences and continuous time processes. Ledbetter.

235 POINT PROCESSES (3). Prerequisite, Statistics 155 or equivalent. Random measures and point processes on general spaces, Poisson and related processes, regularity, compounding. Point processes on the real line stationarity, Palm distributions, Palm-Khintchine formulæ. Convergence and related topics. Ledbetter.

236 STOCHASTIC ANALYSIS (3). Prerequisite, Statistics 154 and 155, or equivalents. An introduction to advanced stochastic analysis, including examples from semimartingale theory, stochastic integrals, homogeneous chaos expansions, stochastic differential equations, Malliavin calculus, infinite dimensional processes, functional central limit theorems. Feynman-Kac formula, Feynman integral. Applications to filtering theory, infinite particle systems, quantum mechanics, and stochastic models in neurophysiology Kallianpur.

240 LINEAR SYSTEMS (3). Prerequisites, advanced calculus, elements of Fourier transform theory; linear algebra and Lebesgue integration helpful. Introduction to linear spaces, including basic results on normed linear spaces. Hilbert space geometry, bounded linear operators. Linear system theory including signal representations, impulse response, transfer functions, dynamical systems, state variable methods, elementary modern control theory. Fall. Staff.


252 INFORMATION THEORY (3). Prerequisite, Statistics 134. Transmission of information, entropy, message ensembles, discrete sources, transmission channels, channel encoding and decoding for discrete channels. Chakravarti.
253 ERROR CORRECTING CODES (3). Prerequisite. Statistics 212 or permission of the instructor. Linear codes and their error-correcting capabilities. Hamming codes, Reed-Muller codes, Cyclic codes, BCH/Goppa codes. Burst error corrections. Majority logic decoding. Chakravarti.


280 ADVANCED STOCHASTIC METHODS OF OPERATIONS RESEARCH (3). Prerequisites, Statistics 132 and 180, or equivalents. Topics chosen from: renewal theory; queues with random arrivals; inequalities for queues; priority systems; theory of reservoirs; stochastic inventory problems. Staff.

300 Level Courses*

300 SEMINAR IN STATISTICAL LITERATURE (1 each). Prerequisite. Statistics 135.

302 SEMINAR IN STATISTICAL DATA ANALYSIS (Var.). Prerequisite. Statistics 105. Smith.

310, 311 SEMINAR IN THEORETICAL STATISTICS (3). Prerequisite. Statistics 135.

321, 322 SPECIAL PROBLEMS (3). Prerequisite, permission of the instructor.

331, 332 ADVANCED RESEARCH (3). Prerequisite, permission of the instructor.

393 MASTER'S THESIS (Var.). Prerequisite, permission of the student's advisor. Fall and spring. Staff.

394 DOCTORAL DISSERTATION (Var.). Prerequisite, permission of the student's advisor. Fall and spring. Staff.

*The following 300-level courses are new or have been offered in recent years. Some of these courses will be offered on a regular basis with a course number after approval from the Graduate School.

PATTERN RECOGNITION. Nobel.

DESIGN AND CODING. Chakravarti.

TOPICS IN COMPUTATIONAL FINANCE. Ji.

STOCHASTIC FINANCE. Kallianpur.

ENVIRONMENTAL STATISTICS. Smith.

DATA-ANALYTIC MODELLINGS AND THEIR APPLICATIONS. Fan.

GIBBS RANDOM FIELDS AND CERTAIN STATISTICAL APPLICATIONS. Ji.

TOPICS IN WEAK CONVERGENCE, MARKOV PROCESSES, AND STOCHASTIC DIFFERENTIAL EQUATIONS. Kallianpur.

FUNCTIONAL DATA ANALYSIS. Marron.

INDUSTRIAL EXPERIMENTATION AND CLINICAL TRIALS: DESIGN AND STATISTICAL ANALYSIS. Chakravarti.

CURRICULUM IN TOXICOLOGY

JAMES A. SWENBERG, Director

Professors
Louise M. Ball, Metabolism and Genotoxicity of Environmental Xenobiotics
Thomas W. Boudin, Neuropathology, Neurotoxicology
Kim Rowe Brouwer, Pharmacokinetics, Hepatic Uptake, Metabolism, and Excretion of Xenobiotics
Stephen G. Chaney, Molecular Biology, Platinum Anticancer Drugs
Maria Concepcion, DNA Replication in Eukaryotic Cells, Chemical Carcinogenesis
Fulton T. Crooks, Neurotransmitter and Hormone Signal Transmission
Channing J. Der, Ras Protein Superfamily, Signal Transduction and Oncogenesis
Kenneth H. Dudley, Drug Metabolism, Stereochemical Aspects of Enzymatic Reactions, Analytical Methods for Drugs and Metabolites
John T. Gartley, Jr., Physiology, Pharmacology, Cell Toxicology, Lung Permeability
Avram Gold, Structure-Activity Relationships in Metabolism and Mutagenicity of Polymeric Aromatic Hydrocarbons
Barry Gov, Virus and Cancer Chemotherapy
Iris H. Hall, Hypolipidemic, Antifertility, Anti-inflammatory, and Antineoplastic Drugs
David J. Holbrook, Jr., Biochemical Toxicology, Platinum Anticancer Drugs, Xenobiotic Metabolism
David G. Kaufman, DNA Replication, Chemical Carcinogenesis
William K. Kaufmann, DNA Metabolism in Radiation and Chemical Carcinogenesis
Jean M. Leder, Developmental Neurobiology and Neuroanatomy
Neurotoxicology, Developmental Biology, Teratology
Steven A. LeDow, Molecular Genetics of Cellular Responses to DNA Damage
John J. Lemasters, Cell Biology of Hypoxic and Toxic Injury, Organ Preservation for Transplantation, Digitalized Video Microscopy
Richard B. Mailman, Neurotoxicology and Neuropharmacology of the Central Nervous System
Patricia F. Maness, Mechanisms of Cell Signaling and Adhesion, Axon Guidance, and Synaptic Plasticity
Pieter Mudd, Myeloma Metabolism, Axonal Transport, Neurotoxicology
Gary M. Polack, Pharmacokinetics and Pharmacodynamics of Therapeutic and Toxic Agents
James A. Raleigh, Metabolism of Nitroheterocyclic Xenobiotics, Measurement of Normal and Tumor Tissue Hypoxia
Stephen M. Rappaport, Exposure Assessment, Industrial Hygiene
R. J. dzie Sambulski, Development of Efficient Viral Vectors for Gene Delivery into Eukaryotic Genes
Aziz Sancar, Molecular Biology, DNA Repair and Cancer, Structure and Function of DNA Repair Enzymes
Gary J. Smith, Molecular Toxicology, In Vivo Mutagenesis and Transformation
Kazuo I. Suzuki, Neuropathology, Genetic Neurological Disorders
James A. Swenberg, DNA Adducts, Cell Proliferation
Ronald G. Thurman, Hepatotoxicity, Oxidative Stress, Organ Preservation
Bernard E. Weissman, Cancer Genetics, Tumor Suppressor Genes

Associate Professors
Curtis Harper, Biochemical Toxicology
A. Leslie Morrow, Neurotoxicology and Excitotoxicity of Alcohol
Philip C. Smith, Toxicokinetics and Xenobiotic Metabolism, Peptide Analysis and Disposition
Assistant Professors
William B. Coleman, Hepatocarcinogenesis, Tumor Suppressor Genes, Biology of Liver Stem Cells
Edward L. LeCluyse, Hepatic Drug Disposition and Regulation of Drug-Metabolizing Enzymes
Robert C. Millikan, Cancer Epidemiology
Leena A. Nylander-French, Environmental and Occupational Exposure Assessment and Modeling, Development of Biological Monitoring Methods for Dermal Exposure
Dale A. Ramsden, V(D)J Recombination and DNA Double Strand Break Repair

Research Associate Professor
Milton J. Flanau, Health Effects of Air Pollutants, Human Studies, Mechanisms of Response

Adjunct Professors
J. Carl Barrett, Cancer, Aging, Senescence, Apoptosis, Breast Cancer, Prostate Cancer
Linda S. Birnbaum, Chemical Disposition of Xenobiotics, Mechanistic Toxicology
John A. Cidlowski, Apoptosis, Steroids, Glucocorticoid Receptors, Hormone Action, Nucleases, Gene Regulation
George W. Lucier, Dioxin, Biologically Based Dose Response Models, Receptor Mechanisms, Risk Assessment
Edward J. Massaro, Cell Toxicology, Developmental Toxicology, Toxicology of Metals
Roger O. McClellan, Inhalation Toxicology
Michael D. Waters, Biosensor Systems for Toxic Substances, Genetic Toxicology

Adjunct Associate Professors
James W. Allen, Mutagenesis, Carcinogenesis, Chromosome Damage
Finis L. Cavender, Inhalation Toxicology, Biochemical Action of Pesticides
Thomas E. Eling, Prostaglandins, Carcinogenesis, Metabolism by Prostaglandin Synthetase
Jae-Young Hwang, Peptide and Neurotransmitters, Neuroendocrinology, Neuropharmacology, Neurochemistry
Ronald P. Mason, Free-Radical Intermediates in the Metabolism of Toxic Chemicals
Stephanie Padilla, Neurotoxicology
Douglas E. Ricker, Xenobiotic Metabolism, Mechanisms of Toxicology
John M. Rogers, Developmental Toxicology, Teratology, Developmental Biology, Embryology, Nutrition
Marylouise J. Selgrade, Effects of Environmental Agents on the Immune System and on Susceptibility to Infectious and Allergic Disease
Robert Sills, Genetic Alterations in Rodent Tumors Following Environmental Exposure, Neuropathology, Atherosclerosis
Ralph J. Smalowicz, Immunotoxicology
Raymond W. Tennant, Transgenic Animals in Carcinogenesis Studies
Hugh A. Tilton Jr., Behavioral Toxicology, Developmental Neurotoxicology
Kenneth R. Tindall, Molecular Mutagenesis, Somatic Cell Mutation, Role of Mutagenesis in Carcinogenesis
Frank Welsch, Endocrine Reproductive and Developmental Toxicology

Adjunct Assistant Professors
Cynthia A. Alphari, Use of Microarrays in Analysis of Gene Expression Changes
J. Christopher Corren, Receptor-Mediated Mechanisms of Toxicity/Carcinogenicity, Genomic Toxicology
Robert B. Devlin, Pulmonary Toxicology, Molecular Biology, Immunology, Human Studies and Environmental Pollutants
Tony R. Fox, Molecular Carcinogenesis, Cell Cycle, Gene Expression, Oncogenes, Tumor Suppressor Genes
Ian Gilmour, Mucosal Immunity of the Respiratory Tract in Models of Lung Disease, Alterations by Exposure to Air Pollutants
Thomas L. Goldsworthy, Proliferation, Apoptosis and Cell Cycle in Hepatocarcinogenesis
G. Jean Harry, Developmental Neurotoxicology, Molecular Neuro/Immunotoxicology
E. Sidney Hunter, Role of Cell Death in Craniofacial Birth Defects
Cindy P. Lawler, Behavioral Toxicology and Neurotoxicology
Michael C. Madden, Arachidonic Acid Metabolism, Oxidative Lung Damage
Leslie Recio, Mechanisms of Genetic Alterations in Humans and Experimental Animals, Mutagenesis, Molecular Carcinogenesis
James M. Semel, Inflammatory Responses to Pollutant Inhalation: Cytokines, Eicosanoids; Signal Transduction Activation in Human Airway Epithelial Cells
Nigel Walker, Dioxins, Hormonal Carcinogenesis, Endocrine Disruptors, Oxidative Stress, Molecular Dosimetry, Toxicogenomics

The Curriculum
The Curriculum in Toxicology administers degree programs leading to the award of the Ph.D. in Toxicology and the M.S. in Toxicology. The curriculum is an interdisciplinary program, and its faculty is drawn from various administrative units of the Schools of Medicine, Pharmacy, and Public Health. The research interests of the faculty are directed primarily at the biochemical and cellular mechanisms of action of toxic substances in mammalian systems, including cultured cells. The interests include most areas of toxicology but major emphases are directed toward molecular and cellular toxicology; neurotoxicology; pulmonary toxicology; and carcinogenesis and mutagenesis. The faculty generally does not conduct research in the areas of aquatic toxicology, forensic toxicology, the ecological aspects of toxicology, or studies in invertebrate systems. The research activities of the Curriculum in Toxicology are conducted in the laboratory facilities assigned to each faculty member by a participating administrative unit.

Applications
Applications for predoctoral studies are considered from students who have received or expect to receive a B.S./B.A. or an M.S. degree in a scientific discipline. A desirable background includes courses in biological sciences (including histology and animal physiology), in chemistry (including analytical and organic), and mathematics through calculus, although all of these are not absolutely essential. A strong course in general biochemistry accelerates the student's progress. Applicants are evaluated on the basis of undergraduate (and graduate) academic performance, Graduate Record Examination scores (General Test, and Subject Test if available), and letters of recommendation. Students are accepted on the basis of their achievement and potential. Special circumstances, including prior research experience and publications, are considered in individual cases in the assessment of qualifications for admission. The curriculum offers a program leading to the M.S. degree only under special circumstances.

Requirements for the Ph.D. Degree
The selection of a predoctoral student's graduate courses is influenced by that student's prior academic background. The minimum academic courses which we consider to be appropriate for graduate training in toxicology constitute approximately thirty-three credit hours in didactic courses including biochemistry, biostatistics, histology, pathology, toxicology, and three elective courses. In addition, each predoctoral student is expected to participate in a minimum of twelve credit hours of nondidactic training activities; i.e., two semesters of laboratory research experience prior to the doctoral research and four seminars. The satisfactory completion of appropriate courses during the prior academic career permits a student to have a greater latitude in the selection of courses.

A major requirement for the Ph.D. degree is a doctoral dissertation based on the student's independent laboratory research. Written and oral examinations are required in the fields of general toxicology and the major research interest.
Financial Aid
The curriculum seeks to fund predoctoral students each year. All applicants are considered for financial aid awards. For the maximum consideration for financial aid awards, applications for admission for the fall semester should be completed by early February and for the spring semester by early October.

Courses for Graduates and Advanced Undergraduates
123 DEVELOPMENTAL TOXICOLOGY AND TERATOLOGY (Cell Biology 123) (2). Prerequisites, basic biology and permission of the instructor. A review of aspects of development which are particularly susceptible to teratogenic insults. Mechanisms by which teratogens affect development are emphasized. Two lecture hours per week. Spring. (Alternate years.) Cell Biology faculty: Sulik (course director).

142 BIOCHEMICAL TOXICOLOGY (Biochemistry 142, Environmental Sciences 193) (3). Prerequisites, Chemistry 130 and one additional biochemistry course (or permission of course director). Biochemical actions of toxicants, and assessment of cellular damage by biochemical measurements. Three lecture hours per week. Spring. Toxicology faculty: Harper (course director).

Courses for Graduates
202 PRINCIPLES OF PHARMACOLOGY AND TOXICOLOGY (Pharmacology 202) (3). Prerequisites, one course in general biochemistry, Physiology 140 or equivalent, and permission of the course director. Introduces the major areas of pharmacology and toxicology and serves as a basis for more advanced courses. Five lecture hours per week. Spring. Pharmacology faculty: Thurman (course director).

207 ADVANCED TOXICOLOGY (Pharmacology 207) (Environmental Sciences 293) (3). Prerequisite, Pharmacology 202 or permission of the course director. Cellular and physiological basis of toxicity of environmental chemicals, with emphasis on inhalation toxicology, developmental toxicology, immunotoxicology, radiation toxicology, renal toxicology, and neurotoxicology. Three lecture hours per week. Fall. Toxicology faculty: Swenberg (course director).

215 INTRODUCTION TO TOXICOLOGICAL RESEARCH (4). Introductory laboratory experience from research projects of limited scope to acquaint students with the experimental approaches, techniques, and equipment of current research in toxicology. May be repeated. Twelve laboratory hours per week. Fall, spring, and summer. Toxicology faculty: Harper (course director).

220 TOXICOLOGY SEMINAR I (1). Seminar series to introduce recent advances, methodology, and terminology in toxicology. One hour per week. Fall and spring. Toxicology faculty: Harper, Holbrook, Padilla (course directors).

221 TOXICOLOGY SEMINAR II (1). Student-conducted presentations and discussions of recent advances in toxicology. Emphasis on critical evaluation of published investigations and on organization and oral delivery of presentations. May be repeated up to six times. One hour per week. Fall and spring. Toxicology faculty: Harper, Holbrook, Padilla (course directors).

222 TOXICOLOGY SEMINAR III (1). Student-conducted presentations reporting progress during the student's degree research. One hour per week. Fall and spring. Toxicology faculty: Harper, Holbrook, Padilla (course directors).

260 TOXICOKINETICS (3). A quantitative examination of the time course of absorption, distribution, metabolism, excretion, and biologic effects of agents of toxicologic interest. Three lecture hours per week. Fall. (1999 and alternate years.) Brouwer, Pollack (course codirectors).

292 SEMINAR IN CARCINOGENESIS (Pathology 292) (2). Prerequisite, permission of the course director. Survey of classical and current literature on selected critical issues in carcinogenesis. Discussions consider experimental methods and observations as well as theories and generalizations. Two seminar hours per week. Fall. (1999 and alternate years.) Pathology faculty: Coleman (course director).

301 RESEARCH IN TOXICOLOGY (2-9). May be repeated for credit. Hours and credits to be arranged. Fall, spring, and summer. Toxicology faculty.

393 MASTER'S THESIS (Var.). May be repeated. Hours and credits to be arranged. Fall, spring, and summer. Toxicology faculty.

394 DOCTORAL DISSERTATION (Var.). May be repeated. Hours and credits to be arranged. Fall, spring, and summer. Toxicology faculty.
The Graduate Faculty

Tenured and Tenure-Track Faculty

Jeffrey S. Abelson, Associate Professor of Business
James R. Abernathy, Ph.D., Professor of Biostatistics, Emeritus
Linda S. Adair, Ph.D., Associate Professor of Nutrition
David Adalsteinsson, Ph.D., Assistant Professor of Mathematics
Elie Maynard Adams, Ph.D., Kenan Professor of Philosophy, Emeritus
John Berry Adams, Ph.D., Professor of Journalism and Mass Communication, Emeritus
Robert S. Adler, J.D., Professor of Business
Shawn C. Ahmed, Ph.D., Assistant Professor of Biology and Assistant Professor of Genetics
Dong-Hyun Ahn, Ph.D., Assistant Professor of Business
Debashis Aikat, Ph.D., Associate Professor of Journalism and Mass Communication
Michael T. Alkire, Ph.D., Professor of Environmental Sciences and Engineering
John S. Akin, Ph.D., Professor and Chair of Economics
Howard E. Aldrich, Ph.D., Kenan Professor of Sociology and Adjunct Professor of Business
James E. Allen, Ph.D., Associate Professor of Health Policy and Administration
Robert C. Allen, Ph.D., Professor of American Studies, Professor of Communication Studies, and Professor of History
Stephen Allred, J.D., Professor of Government and Director and Professor of Public Administration
Louis C. Almkinders, M.D., Associate Professor of Orthopaedics and Associate Professor of Exercise and Sport Science
Marc J. Alperin, Ph.D., Associate Professor of Marine Sciences
Harry Amana, M.A., Professor of Journalism and Mass Communication
Alice K. Ammerman, Ph.D., Associate Professor of Nutrition
David N. Ammons, Ph.D., Professor of Government and Professor of Public Administration
Josef Anderle, Ph.D., Professor of History, Emeritus
Allen L. Anderson, Ph.D., Associate Professor of Music
Carl R. Anderson, Ph.D., Professor of Business
Daniel R. Anderson, Ph.D., Assistant Professor of English
Evan Anderson, Ph.D., Assistant Professor of Economics
James Anderson, Ph.D., Professor of Computer Science
John J. B. Anderson, Ph.D., Professor of Nutrition
Nadia M. Anderson, M.D., Professor of Pathology and Laboratory Medicine
Harold Lee Andrews, Ph.D., Associate Professor of Music, Emeritus
Richard N. L. Andrews, Ph.D., Professor, Department of Public Policy, Professor of Environmental Policy, Carolina Environmental Program, Department of Environmental Sciences and Engineering, Department of City and Regional Planning, Department of Health Policy and Administration, and Curriculum in Ecology
William L. Andrews, Ph.D., E. Maynard Adams Professor of English
Jesse Oscar Anthony III, M.A., Associate Professor of Journalism and Mass Communication
Martine C. Arde, Ph.D., Associate Professor of Romance Languages
Eva S. Anton, Ph.D., Assistant Professor of Cell and Molecular Physiology
Dennis R. Appleby, Ph.D., Professor of Economics, Emeritus
Lorenz Arab, Ph.D., Professor of Epidemiology and Professor of Nutrition
William L. Arendshorst, Ph.D., Professor of Cell and Molecular Physiology
Yaakov S. Ariel, Ph.D., Associate Professor of Religious Studies
Christopher Mead Armitage, Ph.D., Professor of English
Gary M. Armstrong, Ph.D., Professor of Business and Clinical Professor of Pharmacy
Roland R. Arnold, Ph.D., Professor of Dentistry
Carol Arnosti, Ph.D., Associate Professor of Marine Sciences
Idris Assani, Docteur des Sciences, Professor of Mathematics
Ibnamuddin Auksil, D.D.S., Professor of Dentistry
Laurence Green Avery, Ph.D., Professor of English
Stephen R. Aylward, Ph.D., Assistant Professor of Radiology and Adjunct Assistant Professor of Computer Science
Lanier H. Ayscue, M.D., Assistant Professor of Pathology and Laboratory Medicine
Steven Bachmeister, Ph.D., Professor of Microbiology and Immunology and Professor of Genetics and Molecular Biology
Amarjit Badhira, Ph.D., Assistant Professor of Statistics
Tomas Baer, Ph.D., Kenan Professor of Chemistry
Donald B. Bailey Jr., Ph.D., Professor of Education
L'Tanya J. Bailey, D.D.S., Associate Professor of Dentistry
Ronald Dale Baker, D.D.S., Professor of Dentistry, Emeritus
Albert S. Baldwin Jr., Ph.D., Professor of Biology and Professor of Genetics and Molecular Biology
Louise M. Ball, Ph.D., Professor of Environmental Sciences and Engineering and Professor of Toxicology
J. Hunter Ball, Ph.D., Professor of Education
V. William Balthrop, Ph.D., Professor of Communication Studies
Lawrence E. Band, Ph.D., Voit Gilmore Distinguished Professor and Chair of Geography and Professor of Ecology
Nicholas Bandarenko III, M.D., Assistant Professor of Pathology and Laboratory Medicine
Cesareo Bandera, Ph.D., University Distinguished Professor of Romance Languages, Emeritus
John M. Bane Jr., Ph.D., Professor of Marine Sciences, Professor of Geological Sciences, Professor of Environmental Sciences and Engineering, and Adjunct Professor of Physics and Astronomy
Vytas A. Bankaitis, Ph.D., Chair and Professor of Cell and Developmental Biology
Grace T. Baranek, Ph.D., Associate Professor of Occupational Science
Christoph Borchers, Ph.D., Assistant Professor of Biochemistry and Biophysics
W. Clay Bordley, M.D., M.P.H., Assistant Professor of Pediatrics and Adjunct Assistant Professor of Biomedical Engineering
Henry Charles Boren, Ph.D., Professor of History, Emeritus
Kenneth F. Bort, Ph.D., Professor of Microbiology and Immunology, Emeritus
Richard C. Boucher Jr., M.D., William Rand Kenan Professor of Medicine and Adjunct Professor of Genetics and Molecular Biology
Daniel Boudah, Ph.D., Assistant Professor of Education
Thomas W. Buddin, M.D., Professor of Pathology and Laboratory Medicine and Professor of Toxicology
Donald A. Boutron, Ed.D., Clinical Professor of Education, Emeritus
Robert B. Bourette, Ph.D., Associate Professor of Microbiology and Immunology and Associate Professor of Genetics and Molecular Biology
Gary L. Bowen, Ph.D., Kenan Professor of Social Work
Linda C. Bowen, Ph.D., C.P.A., Associate Professor of Business
Thomas A. Bowers, Ph.D., Senior Associate Dean and James L. Knight Professor of Journalism and Mass Communication
Wayne Alexander Bowers, Ph.D., Professor of Physics and Astronomy, Emeritus
Bernard R. Boxill, Ph.D., Professor of Philosophy
Alice Boyington, Ph.D., Assistant Professor of Nursing
Phillip Boyle, Ph.D., Associate Professor of Government and Associate Professor of Public Administration
Lois A. Boynton, Ph.D., Assistant Professor of Journalism and Mass Communication
Timothy J. Bralower, Ph.D., Professor of Geological Sciences and Professor of Marine Sciences
John C. Brantley, Ph.D., Professor of Education
Miriam Brautstein, Ph.D., Assistant Professor of Microbiology and Immunology
Mark E. Brecher, M.D., Professor of Pathology and Laboratory Medicine
George R. Breese Jr., Ph.D., Professor of Psychiatry and Professor of Pharmacology
Jennifer A. Bremer, Ph.D., Adjunct Professor of Public Policy Analysis
Jay E. Brennan, Ph.D., Assistant Professor of Cell and Developmental Biology
David A. Brenner, M.D., Ph.D., Professor of Medicine, Professor of Biochemistry and Biophysics, and Professor of Genetics and Molecular Biology
Patrick J. Brennanwald, Ph.D., Associate Professor of Cell and Developmental Biology
Richard A. Brice, Ed.D., Assistant Professor of Education
Charles V. Briscoe, Ph.D., Professor of Physics and Astronomy, Emeritus
Robert N. Broadus, Ph.D., Professor of Information and Library Science, Emeritus
Donald Leslie Brockington, Ph.D., Professor of Anthropology, Emeritus
Maurice S. Brookhart, Ph.D., Professor of Chemistry
E. Willis Brooks, Ph.D., Associate Professor of History and Associate Professor of Russian and East European Studies
Frederick P. Brooks Jr., Ph.D., Kenan Professor of Computer Science
Linda Brooks, Ph.D., Associate Professor of Education, Emerita
Kim Rouse Brower, Ph.D., Professor of Pharmacy and Professor of Toxicology
Carl F. Brown, Ph.D., Professor of Education, Emeritus
Duane Brown, Ph.D., Professor of Education
Edwin L. Brown, Ph.D., Professor of Classics, Emeritus
Frank Brown, Ph.D., Cary C. Basham Professor of Education
Gregory W. Brown, Ph.D., Assistant Professor of Business
Jane Delano Brown, Ph.D., James L. Knight Professor of Journalism and Mass Communication
Kathleen Brown, Ed.D., Assistant Professor of Education
Dorothy C. Browne, D.P.H., Associate Professor of Maternal and Child Health
Christopher R. Browning, Ph.D., Frank Porter Graham Professor of History
Eleanor M. Browning, M.S., Associate Professor of Nursing, Emerita
R. Lee Brummet, Ph.D., C.P.A., Willard J. Graham Professor of Business, Emeritus
John Bruno, Ph.D., Assistant Professor of Marine Sciences
Rebecca Broach Bryan, M.P.H., Associate Professor of Nutrition, Emerita
Thomas H. Brylawski, Ph.D., Professor of Mathematics
Richard P. Buck, Ph.D., Professor of Chemistry, Emeritus
Amarjit Budhiraja, Ph.D., Assistant Professor of Statistics
Pierre Burekens, M.D., Ph.D., Chair and Professor of Maternal and Child Health
Melissa M. Bullard, Ph.D., Professor of History
Elizabeth Bullitt, M.D., Professor of Surgery and Adjunct Professor of Computer Science
Barbara J. Bunker, M.S.N., Associate Professor of Nursing
Raymond J. Burby, Ph.D., Professor of City and Regional Planning
Hugh Jonathan Burford, Ph.D., Associate Professor of Pharmacology, Emeritus
William I. Burke, Ed.D., Professor of Education, Emeritus
Eileen J. Burke, Ph.D., Associate Professor of Rehabilitation Psychology and Counseling
E. Jefferson Burkes Jr., D.D.S., Professor of Dentistry, Emeritus and Professor of Pathology and Laboratory Medicine
Steven J. Burnham, M.D., Professor of Surgery and Dissertation Committees of Epidemiology
Elizabeth Jane Burns, Ph.D., Chair and L.M. Sllifkin Professor of Women's Studies and Adjunct Professor of Comparative Literature
Kathryn J. Burns, Ph.D., Assistant Professor of History
Keith W. T. Burridge, Ph.D., Professor of Cell and Developmental Biology
Maurice Moyer Bushey, Ph.D., Professor of Chemistry, Emeritus
Jan Busby-Whitehead, M.D., Associate Professor of Medicine and of Physical Education, Exercise and Sport Science
Robert M. Bushman, Ph.D., Professor of Business
J. Robert Butler, Ph.D., Professor of Geological Sciences, Emeritus
Joseph H. Bylinski, Ph.D., Associate Professor of Business
Daniel M. Cable, Ph.D., Associate Professor of Business
Jianwen Cai, Ph.D., Associate Professor of Biostatistics
David Cai, Ph.D., Assistant Professor of Mathematics
Stephen Caola, M.S., Associate Professor of Pharmacy
Peter Calingaert, Ph.D., Professor of Computer Science, Emeritus
Roberto A. Camassa, Ph.D., Professor of Mathematics
Marcia K. Campbell, M.P.H., Associate Professor of Nutrition
Margaret E. Campbell, M.S.N., Associate Professor of Nursing, Emerita
Sharon Campbell, Ph.D., Associate Professor of Biochemistry and Biophysics
Marsha S. Collins, Ph.D., Associate Professor of Romance Languages
Myra L. Collins, M.D., Ph.D., Associate Professor of Pathology and Laboratory Medicine
John M. Conley, J.D., Kenan Professor of Law and Adjunct Professor of Anthropology
Frank Conlon, Ph.D., Assistant Professor of Genetics
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Jeffrey L. Daniel, Ph.D., John N. Couch Professor of Biology, Professor of Genetics and Molecular Biology, and Professor of Microbiology and Immunology
Evelyn H. Daniel, Ph.D., Professor of Information and Library Science
Mark Daniel, Ph.D., Assistant Professor of Health Behavior and Health Education and Assistant Professor of Epidemiology
Jane M. Danielewicz, Ph.D., Associate Professor of English
Robert E. Daniels, Ph.D., Associate Professor of Anthropology and Associate Professor of Folklore
William A. Darby Jr., Ph.D., Cary B. Bohamer Professor of Economics and Adjunct Professor of Sociology
Ceri Dauber, Ph.D., Associate Professor of Communication Studies
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Robert L. Davis, Ph.D., Professor of Mathematics, Emeritus
Virginia G. T. Davis, Ed.D., Associate Professor of Nursing
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Henry Hursell Dearman, Ph.D., Professor of Chemistry, Emeritus
Paul Debroczeny, Ph.D., Alumni Distinguished Professor of Slavic Languages and Literatures, Professor of Comparative Literature, and Professor of Russian and East European Studies, Emeritus
Sarah Rachel Dedmon, Ph.D., Associate Professor of Social Work
Gordon H. DeFries, Ph.D., Professor of Social Medicine, Professor of Medicine, Clinical Professor of Epidemiology, and Clinical Professor of Health Policy and Administration
Marla DeGuzmán, Ph.D., M.A., Assistant Professor of English
Bett J. Dempsey, Ph.D., Assistant Professor of Information and Library Science and Adjunct Assistant Professor of Computer Science
John M. Dennison, Ph.D., Professor of Geological Sciences, Emeritus
Georgette A. Dent, M.D., Associate Professor of Pathology and Laboratory Medicine
Channing J. Der, Ph.D., Professor of Pharmacology, Professor of Toxicology, and Professor of Genetics and Molecular Biology
Joseph M. Desimone, Ph.D., William R. Kenan Jr. Distinguished Professor of Chemistry and Professor of Materials Science
Mohaniá Shuhmeh, Ph.D., Assistant Professor of Cell and Developmental Biology
Robert B. DesJardins, Ph.D., Associate Professor of Business, Emeritus
Alan C. Dessen, Ph.D., Peter G. Phiafas Professor of English
Brenda M. DeVellis, Ph.D., Professor of Health Behavior and Health Education and Research Associate Professor of Psychology
Prasun Dewan, Ph.D., Professor of Computer Science
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Janice M. Dodds, Ed.D., Associate Professor of Nutrition and Associate Professor of Maternal and Child Health
Henrik Dohlman, Ph.D., Associate Professor of Biochemistry and Biophysics
Louise A. Dolan, Ph.D., Professor of Physics and Astronomy
Frank A. Domínguez, Ph.D., Chair and Professor of Romance Languages
Marisa E. Domínguez, Ph.D., Assistant Professor of Health Policy and Administration
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Raymond E. Dooley, M.F.A., Chair and Professor of Dramatic Art
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William H. Dow, Ph.D., Assistant Professor of Health Policy and Administration
Mary C. Dow, Ed.D., Associate Professor of Nursing, Emerita
Eric S. Downing, Ph.D., Associate Professor of Comparative Literature
Mildred Downing, Ph.D., Assistant Professor of Information and Library Science, Emerita
Erik W. Doxtader, Ph.D., Assistant Professor of Communication Studies
Kenneth H. Dudley, Ph.D., Professor of Pharmacology and Professor of Toxicology
Margery Duffey, Ph.D., Professor of Nursing, Emerita
Roberta A. Dunbar, Ph.D., Associate Professor of African and Afro-American Studies
Cherie H. Dunphry, M.D., Associate Professor of Pathology and Laboratory Medicine
Rosa P. Duran, Ph.D., Doris Beris Distinguished Professor
Robert J. Duronio, Ph.D., Assistant Professor of Biology and Assistant Professor of Genetics and Molecular Biology
Kian S. Dy, Ph.D., Professor of Physics and Astronomy
Linda A. Dykstra, Ph.D., William R. Kenan Jr. Professor of Psychology and Research Professor of Pharmacology
H. Shelton Earp III, M.D., Ph.D., Professor of Pharmacology
Jo Anne Earp, Sc.D., Chair and Professor of Health Behavior and Health Education
Yvonne D. Eaves, A.B.D., Assistant Professor of Nursing
Patrick B. Eberlein, Ph.D., Professor of Mathematics
Alva V. Ebersole Jr., Ph.D., Professor of Romance Languages, Emeritus
Connie C. Elbe, Ph.D., Professor of English
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David A. Eckerman, Ph.D., Professor of Psychology, Emeritus
Cora Jean S. Edgell, Ph.D., Associate Professor of Pathology and Laboratory Medicine and Associate Professor of Genetics and Molecular Biology
Marshall H. Edgell, Ph.D., Kenan Professor of Microbiology and Immunology, Professor of Biochemistry and Biophysics, and Professor of Genetics and Molecular Biology
Jesse W. Edgerton, Ph.D., Professor of Psychology, Emeritus
Elizabeth M. Edmunds, M.A., Associate Professor of Public Health Nursing, Emerita
Joseph C. Edozien, M.D., Professor of Nutrition, Emeritus
Jeffrey R. Edwards, Ph.D., Belk Foundation Distinguished Professor of Business
Richard L. Edwards, Ph.D., Alumni Distinguished Professor of Social Work and Professor of Russian and East European Studies
Bart D. Ehrman, Ph.D., Chair and Professor of Religious Studies
A. Richard Ekram, Ph.D., Professor of Journalism and Mass Communication, Emeritus
Regina C. Eldred-Johnson, Ph.D., Professor of Biostatistics, Emerita
Glen H. Elder Jr., Ph.D., Howard W. Odum Professor of Sociology
Ernest L. Elef, Ph.D., William R. Kenan Jr. Professor of Chemistry, Emeritus
Douglas A. Elvers, Ph.D., Professor of Business
Eugenia Erni, Dr.P.H., Professor of Health Behavior and Health Education and Associate Professor of Public Health Leadership Program
Jonathan H. Engel, Ph.D., Associate Professor of Physics and Astronomy
Fenwick English, Ph.D., Robert Wendell Eaves St. Distinguished Professor of Education
Susan T. Emmett, Ph.D., Associate Professor of Health Behavior and Health Education
Ella Gray Wilson Ennis, Ph.D., Associate Professor of Medical Allied Health Professions, Emerita
Barbara Entwisle, Ph.D., Professor of Sociology
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Dorothy A. Erie, Ph.D., Assistant Professor of Chemistry
Carl W. Ernst, Ph.D., Distinguished Professor of Religious Studies
Beverly J. Errede, Ph.D., Professor of Biochemistry and Biophysics and Professor of Genetics and Molecular Biology
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Jianqiong Fan, Ph.D., Professor of Statistics
Rosann A. Farber, Ph.D., Professor of Pathology and Laboratory Medicine and Professor of Genetics
Paul B. Farel, Ph.D., Professor of Cell and Molecular Physiology
Judith B. Farquhar, Ph.D., Professor of Anthropology and Adjunct Professor of Religious Studies
Walter C. Farrell Jr., Ph.D., Professor of Social Work, Adjunct Professor of Health Behavior and Health Education, and Adjunct Professor of Public Policy
Annegrét Fauser, Ph.D., Associate Professor of Music
Robert Gilbert Faust, Ph.D., Professor of Cell and Molecular Physiology, Emeritus
J. Alan Feduccia, Ph.D., S. K. Heninger Professor of Biology and Professor of Ecology
Frank E. Fee, Ph.D., Assistant Professor of Journalism and Mass Communication
Lawrence E. Feinberg, Ph.D., Associate Professor of Slavic Languages and Literatures and Associate Professor of Russian and East European Studies
David A. Felton, D.D.S., Associate Professor of Dentistry
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Arthur L. Finn, M.D., Professor of Medicine and Professor of Cell and Molecular Physiology, Emeritus
Jon W. Finson, Ph.D., Professor of Music
Patricia Z. Fischer, Dr.P.H., Associate Professor of Health Policy and Administration, Emerita
Susan A. Fiscus, Ph.D., Professor of Microbiology and Immunology and Professor of Pathology and Laboratory Medicine
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Michael R. Flynn, S.C.D., Professor of Environmental Sciences and Engineering
Catherine J. Fogel, Ph.D., Professor of Nursing
Jaroslav T. Folda III, Ph.D., N. Ferebee Taylor Professor of Art and Professor of Russian and East European Studies
James D. Folds, Ph.D., Professor of Pathology and Laboratory Medicine and Professor of Microbiology and Immunology
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Vangie A. Foshee, Ph.D., Associate Professor of Health Behavior and Health Education
Donald L. Fox, Ph.D., Professor of Environmental Sciences and Engineering
Paul H. Fraimpton, Ph.D., Louis D. Rubin Jr. Professor of Physics and Astronomy
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Mark W. Fraser, Ph.D., John A. Tate Distinguished Professor of Social Work
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Jean Freeman, B.A., Lecturer of Information and Library Science, Emerita
Jeffrey A. Freilinger, Ph.D., Sarah Graham Kenan Professor of Microbiology and Immunology and Professor of Genetics and Molecular Biology
Cynthia M. Freund, Ph.D., Professor of Nursing, Emerita
Eric C. Frey, Ph.D., Associate Professor of Biomedical Engineering and Assistant Professor of Radiology
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Howard M. Fried, Ph.D., Associate Professor of Biochemistry and Biophysics
James W. Friedman, Ph.D., Professor of Economics, Emeritus
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William K. Funkhouser Jr., M.D., Ph.D., Assistant Professor of Pathology and Laboratory Medicine
Lillian R. Furth, Ph.D., Marcel Bataillon Professor of Comparative Literature
David M. Griffiths, Ph.D., Professor of History and Professor of Russian and East European Studies
Thomas R. Grigg, M.D., Professor of Medicine and Professor of Pathology and Laboratory Medicine
Joe W. Grisham, M.D., Kenan Professor of Pathology and Laboratory Medicine and Professor of Medicine
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John H. Grose, Ph.D., Associate Professor of Surgery and Associate Professor of Speech and Hearing Sciences
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James Haar, Ph.D., William R. Kenan Jr. Professor of Music, Emeritus
Stephanie W. Haas, Ph.D., Associate Professor of Information and Library Science
Charles R. Hackenbrock, Ph.D., Professor of Cell and Developmental Biology, Emeritus
Anthony C. Hackney, Ph.D., Professor of Exercise and Sport Science, Professor of Nutrition, and Adjunct Professor of Cell and Molecular Physiology
Norrin M. Hadler, M.D., Professor of Medicine and Professor of Microbiology and Immunology
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John E. Hammond, Ph.D., Professor of Pathology and Laboratory Medicine, Adjunct Professor of Biomedical Engineering, and Research Associate Professor of Biochemistry and Biophysics
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Jean H. Handy, Ph.D., Associate Professor of Microbiology and Immunology and Associate Professor of Pathology and Laboratory Medicine
Jacob S. Hanley, Ph.D., Professor of Dentistry, Professor of Materials Science, and Professor of Biomedical Engineering, Emeritus
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William R. Harmon, Ph.D., James G. Hanes Professor of English and Professor of Comparative Literature
Joyce B. Harp, M.D., Assistant Professor of Nutrition
Charles L. Harper, Ph.D., Professor of Health Behavior and Health Education, Emeritus
Curris Harper, Ph.D., Associate Professor of Pharmacology and Associate Professor of Toxicology
Howard M. Harper Jr., Ph.D., Professor of English, Emeritus
Joanne S. Harrell, Ph.D., Professor of Nursing
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Michael D. Harris, Ph.D., Assistant Professor of Art
Russell P. Harris, M.D., M.P.H., Associate, Adjunct Associate Professor of Epidemiology and Adjunct Associate Professor of Social Medicine
Trudier Harris, Ph.D., J. Carlyle Sitterson Professor of English and Professor of Folklore
Melody F. Harrison, Ph.D., Associate Professor of Speech and Hearing Sciences
Stuart L. Hart, Ph.D., Associate Professor of Business
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Katherine E. Hartmann, M.D., Ph.D., Assistant Professor of Obstetrics and Gynecology and Assistant Professor of Epidemiology
David J. Harrell, Ph.D., Real Estate Educational Foundation Professor of Business
Abraham G. Harrzem, Ph.D., Adjunct Professor of Epidemiology and Adjunct Professor of Health Policy and Administration
J. Stephen Haskell, Ph.D., Professor of Obstetrics and Gynecology and Professor of Microbiology and Immunology
John Hatch, Dr.P.H., Kenan Professor of Health Behavior and Health Education, Emeritus
Jane M. Hawkins, Ph.D., Professor of Mathematics
Anos W. Hawley, Ph.D., Kenan Professor of Sociology, Emeritus
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John L. Hemingway, Ph.D., Associate Professor of Recreation and Leisure Studies
Bradley M. Hemminger, Ph.D., Assistant Professor of Information and Library Science
Gail E. Henderson, Ph.D., Adjunct Professor of Sociology
Karla A. Henderson, Ph.D., Professor of Recreation and Leisure Studies
Mac G. Henderson, Ph.D., Professor of English
Randall J. Hendrick, Ph.D., Chair and Professor of Linguistics
S. K. Henninger Jr., Ph.D., Professor of English and Professor of Comparative Literature, Emeritus
H. Carlisle Henley Jr., Ph.D., Professor of Social Work, Emeritus
R. Sterling Hennes, Ph.D., Professor of Education, Emeritus
Bonnie K. Henley, M.S.N., Associate Professor of Nursing, Emerita
Odell W. Henson Jr., Ph.D., Professor of Cell and Developmental Biology, Emeritus
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John P. Hernandez, Ph.D., Professor of Physics and Astronomy
H. Garland Hershey Jr., D.D.S., Professor of Dentistry, Adjunct Professor of Health Policy and Administration, and Adjunct Professor of Russian and East European Studies
Joanne L. Hershfield, Ph.D., Associate Professor of Communication Studies
Irva Hertz-Picciotto, Ph.D., Professor of Epidemiology
William T. Herzog, M.S.P.H., Associate Professor of Health Policy and Administration, Emeritus
Jonathan M. Hess, Ph.D., Associate Professor of Germanic Languages and Adjunct Associate Professor of Religious Studies
James L. Hewitt, Ph.D., Associate Professor of History
Joe Bob Heuser, Ph.D., Assistant Professor of Journalism and Mass Communication
Joe A. Hewitt, Ph.D., Professor of Information and Library Science
Harald J. Heymann, D.D.S., M.Ed., Professor of Dentistry
Robert G. Heyneman, Ph.D., Professor of Mathematics, Emeritus
Anthony J. Hickey, Ph.D., M.Sc., Professor of Pharmacy and Adjunct Professor of Biomedical Engineering
Robert D. Higginbotham, Ph.D., Dowd Professor of Peace and War and Professor of History
Marion E. Highrider, D.Sc., Associate Professor of Public Health Nursing and Associate Professor of Nursing, Emerita
Anthony E. Hilger, Ph.D., Associate Professor of Medical Allied Health Professions
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Kenneth J. Hills, Ph.D., Assistant Professor of Communication Studies
Glenn D. Hinson, Ph.D., Associate Professor of Anthropology and Chair and Associate Professor of Folklore
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Fred C. Holbrook Jr., Ph.D., Professor of English and Lineberger Professor in the Humanities
Vanessa G. Hodges, Ph.D., Interim Associate Dean and Associate Professor of Social Work
Stephen Hoeffler, Ph.D., Assistant Professor of Business
Sylvia D. Hoffert, Ph.D., Professor of Women's Studies and of History
David Hofmann, Ph.D., Associate Professor of Business
Carol C. Hogue, Ph.D., Associate Professor of Nursing
David J. Holbrook Jr., Ph.D., Professor of Biochemistry and Biophysics and Professor of Toxicology
Diane Holditch-Davis, Ph.D., Professor of Nursing
Dorothy C. Holland, Ph.D., Chair and Professor of Anthropology
Edward G. Holley, Ph.D., William Rand Kenan Jr. Professor of Information and Library Science, Emeritus
Edward G. Holley, Ph.D., Professor of Information and Library Science, Emeritus
Mark Hollins, Ph.D., Professor of Psychology
William G. Hollister, M.D., M.P.H., Professor of Psychiatry, Emeritus
Beth C. Holmgren, Ph.D., Chair and Professor of Slavic Languages and Literatures and Professor of Russian and East European Studies
Samuel M. Holton, Ph.D., Professor of Education, Emeritus
Max H. Hommersand, Ph.D., Professor of Biology, Emeritus
Liesbet Hooghe, Ph.D., Associate Professor of Political Science
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Gerald C. Horne, Ph.D., Professor of Communication Studies, Professor of African and Afro-American Studies, and Professor of History
Donald T. Hornstein, J.D., Reed C. Ivey II Research Professor of Law and Adjunct Professor of Public Policy
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George W. Houston, Ph.D., Professor of Classics
James F. Howard Jr., M.D., Professor of Neurobiology and Professor of Medicine
Cheryl D. Howell, J.D., Associate Professor of Government
David H. Howells, M.S.S.E., Professor of Environmental Sciences and Engineering, Emeritus
Barry R. Howes, M.S., Associate Professor of Physical Therapy
Vinton A. Hoyos, Ph.D., Professor of Mathematics, Emeritus
Michele M. Hoyman, Ph.D., Associate Professor of Political Science
Henry S. Hsiao, Ph.D., Professor of Biomedical Engineering and Professor of Human Movement Science
Eng-Shang Huang, Ph.D., Professor of Medicine, Professor of Microbiology and Immunology, and Professor of Genetics and Molecular Biology
Jingfang Huang, Ph.D., Assistant Professor of Mathematics
Paul S. Hubbard, Ph.D., Professor of Physics and Astronomy, Emeritus
Evelyn H. Huber, Ph.D., Morehead Alumni Distinguished Professor of Political Science
Margaret E. Hudson, M.Ed., Associate Professor of Nursing
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William D. Huffines, M.D., Professor of Pathology and Laboratory Medicine, Emeritus
Maynard M. Hufschmidt, D.P.A., Professor of Environmental Sciences and Engineering and Professor of City and Regional Planning, Emeritus
G. David Hughes, Ph.D., Burlington Industries Professor of Business, Emeritus
Barbara S. Hula, M.D., Kenan Professor of Epidemiology, Emeritus
Jaroslav F. Hula, M.D., Professor of Obstetrics and Gynecology and Professor of Maternal and Child Health, Emeritus
Ruth A. Humphry, Ph.D., Professor of Occupational Science
Michael H. Hunt, Ph.D., Everett H. Emerson Professor of History
Richard C. Hunter, Ed.D., Professor of Education, Emeritus
Norman L. Hurley, Ph.D., Assistant Professor of Political Science
Andrea M. Huseong, Ph.D., Assistant Professor of Psychology
Clyde A. Hutchison III, Ph.D., Kenan Professor of Microbiology and Immunology and Professor of Genetics and Molecular Biology
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Sarang Joshi, Ph.D., Assistant Professor of Radiation Oncology, Assistant Professor of Biomedical Engineering, and Adjunct Assistant Professor of Computer Science
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Rudolph L. Juliano, Ph.D., Professor of Pharmacology
Enid R. Kafer, M.D., Professor of Anesthesiology and Associate Professor of Cell and Molecular Physiology, Emerita
Tal Kafri, Ph.D., Assistant Professor of Microbiology and Immunology
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Tonu Kalam, M.A., Associate Professor of Music
Arne L. Kalleberg, Ph.D., Kenan Professor of Sociology and Adjunct Professor of Business
Gopinath Kallianpur, Ph.D., Alumni Distinguished Professor of Statistics
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John D. Kasarda, Ph.D., Kenan Professor of Business, Adjunct Professor of Sociology, and Adjunct Professor of Public Policy
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Mildred Kaufman, M.S., Professor of Nutrition, Emeritus
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William K. Kaufmann, Ph.D., Professor of Pathology and Laboratory Medicine, Professor of Toxicology, and Professor of Genetics and Molecular Biology
Thomas H. Kawula, Ph.D., Associate Professor of Microbiology and Immunology
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C. L. Kendall, Ph.D., Associate Professor of Business
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Norberto Keszman, Ph.D., Professor of Mathematics
Horst Kesmenteier, Ph.D., Associate Professor of Physics and Astronomy, Emeritus
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James E. Ketch, M.S., Bowman and Gordon Gray Associate Professor of Music
Asad J. Khattak, Ph.D., Associate Professor of City and Regional Planning
Dmitri V. Khvechchenko, Ph.D., Assistant Professor of Physics and Astronomy
Joseph Kieber, Ph.D., Associate Professor of Biology and Associate Professor of Genetics and Molecular Biology
William M. Kiet, Ph.D., Professor of Biology and Adjunct Professor of Marine Sciences
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Suzanne L. Kirby, M.D., Ph.D., Assistant Professor of Medicine, Assistant Professor of Genetics and Molecular Biology, and Assistant Professor of Pathology and Laboratory Medicine
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David G. Klapper, Ph.D., Professor of Microbiology and Immunology
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William E. Koch, Ph.D., Professor of Cell and Developmental Biology
William Julian Koch, Ph.D., Professor of Biology, Emeritus
Clayton Koelb, Ph.D., Guy B. Johnson Professor of Germanic Languages and Professor of Comparative Literature
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Ryszard Kole, Ph.D., Professor of Pharmacology and Professor of Genetics and Molecular Biology
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Lorne D. Koroluk, D.M.D., Associate Professor of Dentistry
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Mark J. Kuchta, D.D.S., Associate Professor of Dentistry
Alicia A. Kuzniar, Ph.D., Professor of Germanic Languages and Professor of Comparative Literature
Linda Lacey, Ph.D., M.R.P., Professor of City and Regional Planning
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Anthony-Samuel LaMantia, Ph.D., Associate Professor of Cell and Molecular Physiology and Psychiatry
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Wayne R. Landsman, Ph.D., Professor of Business
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Donald T. Lauria, Ph.D., Professor of Environmental Sciences and Engineering
Robert F. Lauterborn, M.A., James L. Knight Professor of Journalism and Mass Communication
Patricia Lawrence, M.S., Associate Professor of Nursing, Emeritus
Richard H. Lawson, Ph.D., Professor of Germanic Languages, Emeritus
Lance G. Lazar, Ph.D., Assistant Professor of Religious Studies
Malcolm R. Leadbetter, Ph.D., Professor of Statistics
Steven A. Leckon, Ph.D., Professor of Radiation Oncology, Professor of Toxicology, and Professor of Genetics and Molecular Biology
Edward L. Lechuyte, Ph.D., Assistant Professor of Pharmacy
Kuo-Hsiaue Li, Ph.D., Kenan Professor of Pharmacy
Andrew L. Lee, Ph.D., Assistant Professor of Pharmacy and Assistant Professor of Biochemistry and Biophysics
David C. Lee, Ph.D., Professor of Biochemistry and Biophysics and Professor of Microbiology and Immunology
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David Leith, D.S., Professor of Environmental Sciences and Engineering
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George S. Lensing Jr., Ph.D., Professor of English
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David P. Levine, Ph.D., Assistant Professor of Education
Madeline G. Levine, Ph.D., Kenan Professor of Slavic Languages and Literatures and Professor of Russian and East European Studies
Megan A. Lewis, Ph.D., Assistant Professor of Health Behavior and Health Education
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Allan R. Life, Ph.D., Associate Professor of English
Alan R. Light, Ph.D., Professor of Cell and Molecular Physiology
Kathleen C. Light, Ph.D., Professor of Neurobiology, Research Professor of Psychology, and Adjunct Professor of Cell and Molecular Physiology
David L. Lillie, Ed.D., Professor of Education, Emeritus
Danyu Lin, Ph.D., Professor of Biostatistics
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Welli Lin, Ph.D., Associate Professor of Radiology and Associate Professor of Biomedical Engineering
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Thomas R. Linden, M.D., Glaxo Wellcome Distinguished Professor of Journalism and Mass Communication
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Laura Linman, Ph.D., Assistant Professor of Health Behavior and Health Education.
Joseph Lipscomb Jr., Ph.D., Professor of Health Policy and Administration
Lewis P. Lipsitz, Ph.D., Professor of Political Science, Emeritus
William F. Little, Ph.D., University Distinguished Professor of Chemistry, Emeritus
Edison T. Liu, M.D., Professor of Medicine, Professor of Epidemiology, Professor of Genetics and Molecular Biology
Gordon G. Liu, Ph.D., Associate Professor of Pharmacy
Jian Liu, Ph.D., Assistant Professor of Pharmacy
Rhe Liu, Ph.D., Assistant Professor of Pharmacy
Chad A. Livasy, M.D., Ph.D., Assistant Professor of Pathology and Laboratory Medicine
Frank A. Loda, M.D., Professor of Pediatrics and Adjunct Professor of Maternal and Child Health
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Kenneth J. Lohmann, Ph.D., L.G. Hoggard Associate Professor of Biology and Associate Professor of Neurobiology
Gertrude London, Diplome de Professeur de Francais a L’Etranger, Docteur de l’Universite de Paris, Academic Postgraduate Diploma in Librarianship, Associate Professor of Information and Library Science, Emeritus
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Anthony G. Lo Re, Ph.D., Professor of Romance Languages, Emeritus
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David L. Lowery, Ph.D., Thomas J. Peasall Professor of Political Science
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Jianping Lu, Ph.D., Associate Professor of Physics and Astronomy and Research Associate Professor of Materials Science
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Richard A. Luetich Jr., Sc.D., Professor of Marine Sciences and Professor of Environmental Sciences and Engineering
Michael L. Lugher, Ph.D., Professor of Public Policy, Adjunct Professor of City and Regional Planning, and Adjunct Professor of Business
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Nobuyuki Maeda, Ph.D., Professor of Pathology and Laboratory Medicine and Professor of Genetics and Molecular Biology
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G. Philip Manu, Ph.D., Kenan Professor of Microbiology and Immunology, Emeritus
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Raleigh C. Mann, B.A., Associate Professor of Journalism and Mass Communication, Emeritus
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Dinesh Manocha, Ph.D., Professor of Computer Science
Gary J. Marchionini, Ph.D., Cary C. Boshamer Distinguished Professor of Information and Library Science
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Victor W. Marshall, Ph.D., Professor of Sociology and Adjunct Professor of Health Behavior and Health Education
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Barclay Martin, Ph.D., Professor of Psychology, Emeritus
Sandra L. Martin, Ph.D., Associate Professor of Maternal and Child Health
Ann E. Manucheck, Ph.D., Professor of Business
William F. Marzloff, Ph.D., Professor of Biochemistry and Biophysics, Professor of Biology, and Professor of Genetics and Molecular Biology
Charlotte H. Mason, Ph.D., Associate Professor of Business
Shirley C. Mason, Ed.D., M.S.N., Associate Professor of Nursing
G. Mallary Masters, Ph.D., Professor of Romance Languages and Professor of Comparative Literature, Emeritus
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Steven W. Matson, Ph.D., Professor of Biology and Professor of Genetics and Molecular Biology
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Ann G. Matthes, Ph.D., Professor of Biology and Professor of Genetics and Molecular Biology
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Carol Mayor, Ph.D., Professor of Art
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Steven K. May, Ph.D., Associate Professor of Communication Studies
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Ketan Mayer-Patel, Ph.D., Assistant Professor of Computer Science
Susan J. Maygaard, M.D., Associate Professor of Pathology and Laboratory Medicine
Robert Mayo, Ph.D., Associate Professor of Speech and Hearing Sciences
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W. James McCoy, Ph.D., Associate Professor of History and Adjunct Professor of Classics
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Harold G. McCurdy, Ph.D., Kenan Professor of Psychology, Emeritus
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Curtis P. McLaughlin, D.B.A., Professor of Business and Professor of Health Policy and Administration, Emeritus
Kenneth McLaughlin, Ph.D., Associate Professor of Mathematics
Richard M. McLaughlin, Ph.D., Associate Professor of Mathematics
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Vonnie McLoyd, Ph.D., Professor of Psychology
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C. Haynes McMullen, Ph.D., Professor of Information and Library Science, Emeritus
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Judith L. Meese, Ph.D., Professor of Education
Gerhard W. Meissner, Ph.D., Professor of Biochemistry and Biophysics and Professor of Cell and Molecular Physiology
H. Craig Melchert, Ph.D., Professor of Linguistics and Professor of Folklore
Vicki S. Mercer, Ph.D., Assistant Professor of Physical Therapy and Human Movement Science
Eugen Merzbacher, Ph.D., Kenan Professor of Physics and Astronomy, Emeritus
Steven R. Meshnick, M.D., Ph.D., Professor of Epidemiology and Professor of Microbiology and Immunology
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Siegfried Mews, Ph.D., Professor of Germanic Languages
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Thomas J. Meyer, Ph.D., Kenan Professor of Chemistry and Professor of Materials Science
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Vasa D. Mihailovich, Ph.D., Professor of Slavic Languages and Literatures, Emeritus
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Nancy Milia, Ph.D., Professor of Nursing and Professor of Health Policy and Administration, Emeritus
C. Arden Miller, M.D., Professor of Maternal and Child Health, Emeritus
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Earl N. Mitchell, Ph.D., Professor of Physics and Astronomy, Emeritus
Mary M. Mitchell, Ph.D., Professor of Occupational Science, Emerita
Ruth U. Mitchell, Ph.D., Professor of Physical Therapy, Emerita
Tom S. Miya, Ph.D., Professor of Pharmacy and Professor of Toxicology, Emeritus
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Mary B. Monahan, Ph.D., Assistant Professor of Education, Emerita
Beatrice B. Mongeau, Ph.D., Associate Professor of Public Health Nursing, Emerita
Edward D. Montgomery Jr., Ph.D., Associate Professor of Romance Languages
James W. Montgomery, Ph.D., Associate Professor of Speech and Hearing Sciences
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Virginia Neelon, Ph.D., Associate Professor of Nursing and Research Assistant Professor of Cell and Molecular Physiology
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Rachel T. Noble, Ph.D., Assistant Professor of Marine Sciences with joint appointment in the Carolina Environmental Program
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James S. Noblit, Ph.D., Professor of Romance Languages
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Leena Nylander-French, Ph.D., Assistant Professor of Environmental Sciences and Engineering and Assistant Professor of Toxicology
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Anthony R. Oberschall, Ph.D., Professor of Sociology and Professor of Russian and East European Studies
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Daniel Okun, Sc.D., Kenan Professor of Environmental Sciences and Engineering, Emeritus
Mary W. Oliver, LL.B., J.D., Professor of Law and Professor of Information and Library Science, Emerita
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Hui Ou-Yang, Ph.D., Assistant Professor of Business

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David W. Owens, J.D., M.R.P., Professor of Government and Adjunct Professor of Public Administration
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William R. Parke, Ph.D., Associate Professor of Economics
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Patricia S. Parker, Ph.D., Assistant Professor of Communication Studies
Clifford R. Parks, Ph.D., Professor of Biology
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Gabor Patalka, Ph.D., Assistant Professor of Operations Research
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Joseph H. Perlmutt, Ph.D., Professor of Cell and Molecular Physiology, Emeritus
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Thomas D. Peters, Ph.D., Professor of Biology and Professor of Genetics and Molecular Biology
Martha D. Pesek, Ph.D., Assistant Professor of Education
Peter Petruzzi, M.D., Ph.D., Professor of Cell and Developmental Biology
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David W. Pfennig, Ph.D., Associate Professor of Biology and Associate Professor of Ecology
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Zlatko Plese, Ph.D., Assistant Professor of Religious Studies
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William S. Pollinzer, Ph.D., Professor of Cell Biology and Anatomy and Professor of Anthropology, Emeritus
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Doris T. Poole, Ph.D., Associate Professor of Pharmacology, Emeritus
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Brian J. Popko, Ph.D., Professor of Biochemistry and Biophysics and Professor of Genetics and Molecular Biology
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William S. Powell, M.A., Professor of History, Emeritus
William E. Prentice Jr., Ph.D., Professor of Exercise and Sport Science, Professor of Orthopaedics, and Professor of Human Movement Science
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John R. Pringle, Ph.D., William R. Kenan Jr. Professor of Biology and Professor of Genetics and Molecular Biology
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Patricia J. Pukkila, Ph.D., Associate Professor of Biology and Associate Professor of Genetics and Molecular Biology
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Bahjar J. Qaish, Ph.D., Associate Professor of Biostatistics
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James A. Raleigh, Ph.D., Professor of Radiation Oncology and Professor of Toxicology
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Rebecca Ratner, Ph.D., Assistant Professor of Business
David J. Ravenscraft, Ph.D., Julian Price Professor of Business
Marjorie S. Reed, Ph.D., Research Professor of Pathology and Laboratory Medicine, Emerita
Kenneth J. Reckford, Ph.D., Kenan Distinguished Professor of Classics
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Matthew Redinbo, Ph.D., Assistant Professor of Chemistry and Assistant Professor of Biochemistry and Biophysics
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Howard M. Reisner, Ph.D., Professor of Pathology and Laboratory Medicine and Professor of Microbiology and Immunology
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Thomas C. Ricketts, Ph.D., Professor of Health Policy and Administration, Associate Professor of Public Health Leadership Program, and Associate Professor of Russian and East European Studies
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Julian G. Rosenman, M.D., Ph.D., Professor of Radiation Oncology, Adjunct Professor of Computer Science, and Adjunct Professor of Biomedical Engineering
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Michael Rubenstein, Ph.D., Associate Professor of Chemistry and Research Associate Professor of Materials Science
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Carol W. Runyan, Ph.D., Associate Professor of Health Behavior and Health Education and Adjunct Associate Professor of Epidemiology
Desmond K. Runyan, M.D., Professor of Social Medicine and Clinical Professor of Epidemiology
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Caryl E. Rushbult, Ph.D., J. Ross Macdonald Professor of Psychology
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Aldo Rustioni, M.D., Professor of Cell and Developmental Biology and Professor of Cell and Molecular Physiology
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R. Jude Samulski, Ph.D., Professor of Pharmacology, Professor of Genetics and Molecular Biology, and Professor of Toxicology
Aziz Sancar, M.D., Ph.D., Professor of Biochemistry and Biophysics, Professor of Toxicology, and Professor of Genetics and Molecular Biology
Gwendolyn B. Sancar, Ph.D., Professor of Biochemistry and Biophysics and Professor of Genetics and Molecular Biology
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Robert S. Sandler, M.D., M.P.H., Professor of Medicine and Professor of Epidemiology
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Barry F. Saunders, Ph.D., M.D., Assistant Professor of Social Medicine, Clinical Assistant Professor of Medicine and Family Medicine, Adjunct Assistant Professor of Religious Studies, and Adjunct Assistant Professor of Anthropology
David A. Savin, Ph.D., Chair and Professor of Epidemiology
Patricia E. Sawin, Ph.D., Assistant Professor of Anthropology and Assistant Professor of Folklore
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C. Margaret Scarry, Ph.D., Associate Professor of Anthropology
Earl S. Schaefer, Ph.D., Professor of Maternal and Child Health, Emeritus
Morris Schaefer, D.P.A., Clinical Professor of Health Policy and Administration, Emeritus
Michael D. Schaller, Ph.D., Associate Professor of Cell and Developmental Biology
Cynthia K. Schauer, Ph.D., Associate Professor of Chemistry
George Schlesinger, Ph.D., Professor of Philosophy, Emeritus
Michael Schlessinger, Ph.D., Professor of Mathematics, Emeritus
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Joel Schwartz, Professor of Political Science, Emeritus
Christoph E. Schweitzer, Ph.D., Professor of Germanic Languages, Emeritus
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Françoise M. Sellier-Moiseiwitsch, Ph.D., Associate Professor of Biostatistics
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William M. Shaw Jr., Ph.D., Professor of Information and Library Science, Emeritus
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Diane C. Shugars, D.D.S., Ph.D., Associate Professor of Dentistry and Associate Professor of Microbiology and Immunology
David P. Siderovski, Ph.D., Assistant Professor of Pharmacology
Anna Maria Siega-Riz, Ph.D., Assistant Professor of Maternal and Child Health and Assistant Professor of Nutrition
Earl Siegel, M.D., Professor of Maternal and Child Health and Clinical Professor of Pediatrics, Emeritus
Agerg Sigurdsson, D.D.S., Associate Professor of Dentistry
John M. Silva, Ph.D., Professor of Exercise and Sport Science and Professor of Human Movement Science
Lawrence M. Silverman, Ph.D., Professor of Pathology and Laboratory Medicine and Professor of Genetics
Myron S. Silverman, Ph.D., Professor of Microbiology and Immunology, Emeritus
Rune J. Simeonsson, Ph.D., Professor of Education and Research Professor of Psychology
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Harsharan K. Singh, M.D., Associate Professor of Pathology and Laboratory Medicine
Anne H. Skelly, Ph.D., Associate Professor of Nursing
C. J. Skender, Ph.D., Adjunct Professor of Business
Gary D. Slade, Ph.D., D.D.S., Associate Professor of Dentistry and Clinical Assistant Professor of Epidemiology
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Betsy L. Sleath, Ph.D., Associate Professor of Pharmacy, Adjunct Associate Professor of Health Policy and Administration, and Adjunct Associate Professor of Epidemiology
Steven L. Slezak, Ph.D., Assistant Professor of Business
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Philip D. Sloan, M.D., Professor of Family Medicine and Clinical Professor of Epidemiology
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Scott R. Smith, Ph.D., Assistant Professor of Pharmacy and Adjunct Assistant Professor of Epidemiology
Scott V. Smith, M.D., Assistant Professor of Pathology and Laboratory Medicine
Sidney R. Smith Jr., Ph.D., Professor of Germanic Languages, Emeritus
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John E. Sondel, Ph.D., Assistant Professor of Pharmacology and Associate Professor of Biochemistry and Biophysics
Conghe Song, Ph.D., Assistant Professor of Geography
Diane H. Sonnenwald, Ph.D., Associate Professor of Information and Library Science and Adjunct Associate Professor of Computer Science
Johann Sonner, Dr. Rer. Nat., Professor of Mathematics, Emeritus
James R. Sorensen, Ph.D., Professor of Health Behavior and Health Education
Thomas N. Sorrell, Ph.D., Professor of Chemistry
Janet H. Southerland, D.D.S., Assistant Professor of Dentistry
Joyce W. Sparling, Ph.D., Associate Professor of Physical Therapy and Dissertation Committees of Education, Emerita
P. Frederick Sparling, M.D., Distinguished Professor of Medicine and Professor of Microbiology and Immunology
Dixie L. Spiegel, Ph.D., Professor of Education
Linda L. Sperrmilli, Ph.D., Professor of Chemistry
Joseph St. Jean Jr., Ph.D., Professor of Geological Sciences, Emeritus
Philip A. Stadler, Ph.D., Eugene Falk Professor of Humanities, Professor of Classics and Professor of Comparative Literature
Darrel W. Stafford, Ph.D., Professor of Biology and Professor of Pathology and Laboratory Medicine
John W. Stamm, D.D.S., D.D.P.H., Dean and Professor of Dentistry and Adjunct Professor of Epidemiology
Lola V. Stamm, Ph.D., Associate Professor of Epidemiology
Donald F. Stanat, Ph.D., Professor of Computer Science, Emeritus
Donald M. Stanford Jr., Ph.D., Adjunct Associate Professor of Business
Kathryn Starkey, Ph.D., Assistant Professor of Germanic Languages
Sally C. Stearns, Ph.D., Associate Professor of Health Policy and Administration
Allan B. Steecker, Dr.P.H., Professor of Health Behavior and Health Education
Donald J. Stedman, Ph.D., Professor of Education
Marco R. Steenbergen, Ph.D., Associate Professor of Political Science
Michael A. Stegman, Ph.D., Duncan MacRae '09 and Rebecca Kyle MacRae Professor of Public Policy, Adjunct Professor of Business, and Adjunct Professor of City and Regional Planning
Jurg Steiner, Ph.D., Professor of Political Science
John B. Stephens, Ph.D., Assistant Professor of Government and Assistant Professor of Public Administration
John D. Stephens, Ph.D., Gerhard E. Lenski Jr. Distinguished Professor of Political Science and Adjunct Professor of Sociology
Vincas P. Steponaitis, Ph.D., Professor of Anthropology
H. June Stevens, Ph.D., Professor of Nutrition and Professor of Epidemiology
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Kevin G. Stewart, Ph.D., Associate Professor of Geological Sciences
William S. Stewart, J.D., Professor of Law, Emeritus
Shaler Stidham Jr., Ph.D., Professor of Operations Research
James A. Stimson, Ph.D., Raymond H. Dawson Distinguished Professor of Political Science
Alan E. Stiven, Ph.D., Professor of Biology and Professor of Ecology
E. Barbara Stocking, M.P.H., Associate Professor of Maternal and Child Health, Emerita
C. S. Stone Jr., M.A., Walter Spearman Professor of Journalism and Mass Communication
Lynda Stone, Ph.D., Associate Professor of Education
P. David Stotts Jr., Ph.D., Associate Professor of Computer Science
Brian Strahl, Ph.D., Assistant Professor of Biochemistry and Biophysics
Joseph W. Staley, Ph.D., Professor of Physics and Astronomy, Emeritus
Dulcie Straughan, Ph.D., Associate Professor of Journalism and Mass Communication
William R. Straughn Jr., Ph.D., Professor of Microbiology and Immunology, Emeritus
Ronald P. Strauss, D.M.D., Ph.D., Distinguished Professor of Dentistry, Professor of Social Medicine, and Clinical Professor of Epidemiology
Kimberly Strom-Gottfried, Ph.D., Associate Professor of Social Work
Koleman S. Strumpf, Ph.D., Associate Professor of Economics
Ann E. Stuart, Ph.D., Professor of Cell and Molecular Physiology and Professor of Ophthalmology
Gary B. Stuck, Ed.D., Professor of Education
Thomas A. Stumpf, Ph.D., Associate Professor of English
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Mary C. Sturgeon, Ph.D., Professor of Art and Adjunct Professor of Classics
Brian W. Sturm, Ph.D., Assistant Professor of Information and Library Science
Janet M. Sturm, Ph.D., Assistant Professor of Speech and Hearing Sciences
Randall G. Styer, Assistant Professor of Religious Studies
Linh Su, Ph.D., Associate Professor of Microbiology and Immunology and Assistant Professor of Genetics and Molecular Biology
Chirayath M. Suchindran, Ph.D., Professor of Biostatistics
Kathleen K. Sulik, Ph.D., Professor of Cell and Developmental Biology
Robert S. Sullivan, Ph.D., Dean of Kenan-Flagler Business School and Professor of Business
Terry O. Sullivan, Ph.D., Associate Professor of Political Science
George K. Summer, M.D., Professor of Biochemistry and Biophysics, Emeritus
Baohong Sun, Ph.D., Assistant Professor of Business
Richard Superfine, Ph.D., Associate Professor of Physics and Astronomy, Research Assistant Professor of Materials Science, and Adjunct Associate Professor of Computer Science
Kinuko I. Suzuki, M.D., Professor of Pathology and Laboratory Medicine and Professor of Toxicology
Jayshankar Swaminathan, Ph.D., Associate Professor of Operations Research and Associate Professor, Kenan-Flagler Business School
Ronald I. Swanson, Ph.D., Professor of Biochemistry and Biophysics, Professor of Microbiology and Immunology, and Professor of Genetics and Molecular Biology
John M. Sweeney, M.Ed., Professor of Journalism and Mass Communication
James A. Swenberg, D.V.M., Ph.D., Professor of Environmental Sciences and Engineering, Professor of Nutrition, Professor of Pathology and Laboratory Medicine, and Professor of Toxicology
Ingrid Swenson, Dr.P.H., Associate Professor of Nursing, Emerita
Edward J. Swift, D.D.S., M.S., Professor of Dentistry
Boyd R. Switzer, Ph.D., Associate Professor of Nutrition
Michael J. Symons, Ph.D., Professor of Biostatistics
Richard J. A. Talbert, Ph.D., William R. Kenan Professor of History and Adjunct Professor of Classics
Dorothy M. Talbot, Ph.D., Professor of Public Health Nursing, Emerita
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Donald G. Tarbet, Ed.D., Professor of Education, Emeritus
Helen V. Tauchen, Ph.D., Professor and Associate Chair of Economics
Paul W. Tawney, M.D., Assistant Professor of Human Movement Science
Petrus W. Tax, Ph.D., Professor of Germanic Languages, Emeritus
Beverly W. Taylor, Ph.D., Professor of English
George Vanderbeck Taylor, Ph.D., Professor of History, Emeritus
Joan M. Taylor, Ph.D., Assistant Professor of Pathology and Laboratory Medicine
Lorraine C. Taylor, Ph.D., Assistant Professor of Psychology
Michael E. Taylor, Ph.D., Kenan Professor of Mathematics
Todd W. Taylor, Ph.D., Assistant Professor of English
Morton I. Teicher, Ph.D., Professor of Social Work, Emeritus
Joseph L. Templeton, Ph.D., Professor of Chemistry
Junius H. Terrell, Ph.D., C.P.A., Professor of Business, Emeritus
Nicola Terrenato, Ph.D., Assistant Professor of Classics
Andreas Teske, Ph.D., Associate Professor of Marine Sciences with joint appointment in the Carolina Environmental Program
Meenu Tewari, Ph.D., Assistant Professor of City and Regional Planning
Daniel A. Teztoris, Ph.D., Professor of Geological Sciences, Emeritus
Dhiren Thakker, Ph.D., Ferguson Distinguished Professor of Pharmacy and Professor of Pharmacology
Todd E. Thiele, Ph.D., Assistant Professor of Psychology
David M. Thissen, Ph.D., Professor of Psychology
James C. Thomas, Ph.D., Associate Professor of Epidemiology
Herman O. Thompson, Ph.D., Professor of Pharmacy, Emeritus
James P. Thompson, Ph.D., Professor of English
Jeffrey Y. Thompson, Ph.D., Associate Professor of Dentistry and Adjunct Associate Professor of Biomedical Engineering
Nancy L. Thompson, Ph.D., Professor of Chemistry
Robert L. Thompson, M.D., Clinical Professor of Pathology and Laboratory Medicine, Emeritus
Vaida D. Thompson, Ph.D., Professor of Psychology
William J. Thompson, Ph.D., Professor of Physics and Astronomy
Weldon E. Thornton, Ph.D., William and Jeanne Jordan Professor of English
H. Holden Thorp, Ph.D., Professor of Chemistry
John M. Thorp, M.D., Associate Professor of Obstetrics and Gynecology, Associate Professor of Radiology, and Adjunct Associate Professor of Epidemiology
Debbie E. Thorpe, Ph.D., PT, PCS, Assistant Professor of Physical Therapy
Robert L. Thorpe, M.Ed., Associate Professor of Medical Allied Health Professions
Suzanne M. Thoyle, Ph.D., Assistant Professor of Nursing
Jane F. Thrailkill, Ph.D., Assistant Professor of English
David W. Threadgill, Ph.D., Assistant Professor of Genetics and Molecular Biology
Helen R. Tibbo, Ph.D., Frances Carroll McCall Term Associate Professor of Information and Library Science
Richard R. Tidwell, Ph.D., Professor of Pathology and Laboratory Medicine and Medicinal Chemistry
Rollie Tillman, D.B.A., Professor of Business
George B. Tindall, Ph.D., Kenan Professor of History, Emeritus
Jenny P. Ting, Ph.D., Professor of Microbiology and Immunology and Professor of Genetics and Molecular Biology
Michael Ting, Ph.D., Assistant Professor of Political Science
Roland M. Tisch, Ph.D., Assistant Professor of Microbiology and Immunology
Judy J. Tisdale, Ph.D., Adjunct Assistant Professor of Business
Lori A. Todd, Ph.D., Associate Professor of Environmental Sciences and Engineering
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Silvia Tomaskova, Ph.D., Assistant Professor of Anthropology
Mark Tommerdahl, Ph.D., Assistant Professor of Biomedical Engineering
Michael D. Topal, Ph.D., Professor of Pathology and Laboratory Medicine, Professor of Dentistry, Professor of Biochemistry and Biophysics, and Professor of Genetics and Molecular Biology
Sevin U. Towerud, M.D., Dr.Odont., Professor of Pharmacology and Professor of Dentistry, Emeritus
Neal H. Tracy, Ed.D., Professor of Education, Emeritus
Thomas W. Traut, Ph.D., Professor of Biochemistry and Biophysics
JoAnn Trejo, Ph.D., Assistant Professor of Pharmacology
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Martin Tropel, D.M.D., Freedland Professor of Dentistry
Alexander Troppha, Ph.D., Associate Professor of Pharmacy and Adjunct Associate Professor of Biomedical Engineering
Carroll-Anne Trueman, M.S., M.A., Associate Professor of Dentistry
Kinh N. Truong, Ph.D., Professor of Biostatistics
Maria Tsipera, Ph.D., Professor of Linguistics, Emerita
Amy O. Tsui, Ph.D., Professor of Maternal and Child Health
Benjamin N. Tsui, Ph.D., Professor of Biomedical Engineering, Professor of Materials Science, Professor of Radiology, and Professor of Material Science
Frank Tsui, Ph.D., Assistant Professor of Physics and Astronomy and Research Assistant Professor of Materials Science
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J. F. Camilla Tulloch, F.D.S., D.Orth., Professor of Dentistry
Boone A. Turch, Ph.D., Associate Professor of Economics
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Sarah Weiss, Ph.D., Assistant Professor of Music
Shirley F. Weiss, Ph.D., Professor of City and Regional Planning, Emerita
Stephen F. Weiss, Ph.D., Chair and Professor of Computer Science
Bernaad E. Weissman, Ph.D., Professor of Pathology and Laboratory Medicine, Professor of Genetics and Molecular Biology, Professor of Pediatrics, and Professor of Toxicology
Ellen C. Wells, M.D., Assistant Professor of Obstetrics and Gynecology and Dissertation Committee of Psychology
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LeRoy D. Werley Jr., Ph.D., Associate Professor of Pharmacy, Emeritus
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Brent W. Weston, M.D., Associate Professor of Pediatrics and Associate Professor of Genetics and Molecular Biology
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Robert G. Wetzel, Ph.D., Professor of Environmental Sciences and Engineering
Stephen C. Whalen, Ph.D., Associate Professor of Environmental Sciences and Engineering and Assistant Professor of Ecology
Francis M. Whang, M.S., Associate Professor of Music
Herbert C. Whitniss, M.D., Ph.D., Assistant Professor of Pathology and Laboratory Medicine
David E. Whisnant, Ph.D., Professor of English, Adjunct Professor of American Studies, Adjunct Professor of Communication Studies, and Adjunct Professor of Art, Emeritus
Richard Whisnant, J.D., Associate Professor of Public Administration
Gordon P. Whitaker, Ph.D., Professor of Government, Professor of Public Administration, and Adjunct Professor of Public Policy
Gilbert C. White II, M.D., John C. Parker M.D. Distinguished Professor of Medicine and Professor of Pharmacology
James W. White, Ph.D., Professor of Political Science
Kinnard White, Ph.D., Visiting Professor of Education, Emeritus
Peter S. White, Ph.D., Professor of Biology and Professor of Ecology
Raymond P. White Jr., D.D.S., Ph.D., McMichael Professor of Dentistry
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Thomas M. Whitmore, Ph.D., Associate Professor of Geography and Associate Professor of Ecology
Peter Whitridge, Ph.D., Assistant Professor of Anthropology
Barry L. Whittet, Ph.D., Professor of Cell and Molecular Physiology and Professor of Biomedical Engineering
Dale Whittington, Ph.D., Professor of Environmental Sciences and Engineering, Professor of City and Regional Planning, and Professor of Public Policy
D. Clay Whybark, Ph.D., Macon Patton Professor of Business
Ronald Wiegerink, Ph.D., Professor of Education, Emeritus
Margaret J. Wiener, Ph.D., Associate Professor of Anthropology and Adjunct Associate Professor of Religious Studies
Jack K. Wier, Ph.D., Associate Professor of Pharmacy, Emeritus
James A. Wiggins, Ph.D., Associate Professor of Sociology, Emeritus
R. Mark Wightman, Ph.D., Kenan Professor of Chemistry
Christopher J. Wild, Ph.D., Assistant Professor of Germanic Languages
James A. Wilde, Ph.D., Associate Professor of Economics
Barbara M. Wildermuth, Ph.D., Professor of Information and Library Science and Adjunct Professor of Biomedical Engineering
Aldridge D. Wilder Jr., D.D.S., Professor of Dentistry
Rebecca S. Wilder, M.S., Associate Professor of Dentistry
Ralph E. Willemann Jr., Ed.D., Professor of Education, Emeritus
R. Haven Wiley, Ph.D., Professor of Biology and Professor of Ecology
William L. Wiley, Ph.D., Kenan Professor of Romance Languages, Emeritus
Cynthia L. Wilhelm, Ph.D., Associate Professor of Rehabilitation Psychology and Counseling, Clinical Associate Professor of Pediatrics, and Clinical Associate Professor of Psychiatry
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Mark Williams, Ph.D., Professor of Mathematics
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Joel R. Williamson, Ph.D., Linneberger Professor of History
Rachel A. Willis, Ph.D., Associate Professor of American Studies and Adjunct Associate Professor of Economics
Elizabeth M. Wilson, Ph.D., Professor of Pediatrics and Professor of Biochemistry and Biophysics
Robert N. Wilson, Ph.D., Professor of Sociology, Emeritus
Stafford Wing, M.M., Associate Professor of Music
Steven B. Wing, Ph.D., Associate Professor of Epidemiology
Bruce P. Winterhalder, Ph.D., Professor of Anthropology and Professor of Ecology
Brent S. Wissick, M.M., Associate Professor of Music and Associate Professor of Russian and East European Studies
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Joseph S. Wittig, Ph.D., Professor of English
Warren R. Wogen, Ph.D., Professor of Mathematics
Susan Wolf, Ph.D., Edna J. Koury Distinguished Professor of Philosophy
Jessica Wolfe, Ph.D., Assistant Professor of English
Richard V. Wolfenden, Ph.D., Alumni Distinguished Professor of Biochemistry and Biophysics
Wendy Woldorf, Ph.D., Assistant Professor of Geography
Julia T. Wood, Ph.D., Professor of Communication Studies
Marion Woods, Ph.D., Professor of Nursing, Emerita
Wendy H. Wood, Ph.D., Assistant Professor of Occupational Science
Ann M. Woodward, D.M.A., Professor of Music, Emerita
John T. Wooley, M.D., Ph.D., Associate Professor of Pathology and Laboratory Medicine
Cecil W. Wootten, Ph.D., Professor of Classics
Deil Spencer Wright, Ph.D., Alumni Distinguished Professor of Political Science and Professor of Public Administration, Emeritus
Fred A. Wright, Ph.D., Associate Professor of Biostatistics
Fred B. Wright, Ph.D., Professor of Mathematics, Emeritus
J. Timothy Wright, D.D.S., Professor of Dentistry
Xiaodong Wu, Ph.D., Assistant Professor of Economics
Yue Wu, Ph.D., Associate Professor of Physics and Astronomy and Research Associate Professor of Materials Science
Yue Xiong, Ph.D., Associate Professor of Biochemistry and Biophysics and Associate Professor of Genetics and Molecular Biology
Mitsuo Yamauchi, D.D.S., Sunstar Distinguished Professor of Dentistry
Bonnie C. Yankaskas, Ph.D., Professor of Radiology and Adjunct Associate Professor of Epidemiology
Wendell Yarbrough, M.D., Associate Professor of Biochemistry and Biophysics
Richard Asa Yarnell, Ph.D., Professor of Anthropology, Emeritus
David E. Yoder, Ph.D., Professor of Speech and Hearing Sciences and Research Professor of Education, Emeritus
Lloyd R. Yonce, Ph.D., Professor of Physiology and Professor of Biomedical Engineering, Emeritus
Jan J. Yopp, M.A., Associate Dean and Professor of Journalism and Mass Communication
Anne Y. York, Ph.D., Assistant Professor of Business
James W. York Jr., Ph.D., Agnew H. Bahnsen and Physics and Astronomy
Forrest W. Young, Ph.D., Professor of Psychology, Emeritus
William J. Young, M.D., Professor of Medicine and Professor of Microbiology and Immunology
Bing Yu, Ph.D., Assistant Professor of Physical Therapy and Assistant Professor of Orthopedics
Gang Yue, M.A., Associate Professor of Asian Studies
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Richard H. Zaffren, Ph.D., Associate Professor of Philosophy
David J. Zajac, Ph.D., Associate Professor of Dentistry
Gal Zauberman, Ph.D., Assistant Professor of Business
Steven H. Zeisel, Ph.D., M.D., Chair and Professor of Nutrition
Valerie Zeitlin, D.B.A., Professor of Business
William N. Zelman, Ph.D., Professor of Health Policy and Administration and Clinical Associate Professor of Pharmacy
Donglin Zeng, Ph.D., Assistant Professor of Biostatistics
Michael W. Zenge, M.M., Professor of Music, Emeritus
Marc Zener, Ph.D., Professor of Business
Harold Zhang, Ph.D., Associate Professor of Business
Yi Zhang, Ph.D., Assistant Professor of Biochemistry and Biophysics and Assistant Professor of Genetics and Molecular Biology
Xinshu Zhao, Ph.D., Associate Professor of Journalism and Mass Communication
Hao Zhou, Ph.D., Assistant Professor of Biostatistics
Ott O. Zhou, Ph.D., Assistant Professor of Physics and Astronomy and Research Assistant Professor of Materials Science
Thomas L. Ziemiecki, D.D.S., Associate Professor of Dentistry
Sheryl I. Zimmerman, Ph.D., Associate Professor of Social Work and Adjunct Associate Professor of Epidemiology
Lee E. Zonn, Ph.D., Professor of Geography
Fei Zou, Ph.D., Assistant Professor of Biostatistics
Charles G. Zug III, Ph.D., Professor of English and Professor of Folklore, Emeritus
John R. Zuniga, D.D.S., Ph.D., Professor of Dentistry

Fixed-Term Faculty
Hussein Abdel-Wahab, Ph.D., Adjunct Professor of Computer Science
Kimberly T. Abels, Ph.D., Director of the Writing Center for the Department of English
David S. Abernethy, M.P.H., Adjunct Lecturer of Health Policy and Administration
James L. Abrahamson, Ph.D., Visiting Professor of History
Scott D. Adams, M.S.I.S., Director of Information Technology and Services and Lecturer of Information and Library Science
Judith L. Adamson, B.A., Adjunct Professor of Dramatic Art
Robert J. Adler, Ph.D., Adjunct Professor of Statistics
Cynthia A. Afsari, Ph.D., Adjunct Assistant Professor of Toxicology
Pankaj K. Agarwal, Ph.D., Adjunct Professor of Computer Science
Kathryn B. Ahearn, M.S.P.H., Adjunct Lecturer of Health Policy and Administration
Suresh K. Alahari, Ph.D., Research Assistant Professor of Pharmacology
Phillip W. Albro, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
Lorraine K. Alexander, Dr.P.H., Clinical Assistant Professor of Epidemiology
James W. Allen, Ph.D., Adjunct Associate Professor of Toxicology
Richard M. Allen, Ph.D., Research Assistant Professor of Psychology
Gregory S. Allison, B.A., Lecturer of Government and Lecturer of Public Administration
Paula C. Alston, B.S., Adjunct Instructor of Health Behavior and Health Education
Mary Altpeiter, M.S.W., Adjunct Lecturer of Health Behavior and Health Education
Deborah A. L. Amaral, Ph.D., Adjunct Professor of Public Policy, Adjunct Assistant Professor of Health Policy and Administration, and Adjunct Assistant Professor of Environmental Sciences and Engineering
Robert N. Anderson, Ph.D., Adjunct Associate Professor of Romance Languages
Bonnie Angel, Ed.D., M.S.N., Clinical Associate Professor of Nursing
Samuel J. Arbes Jr., Ph.D., Adjunct Assistant Professor of Health Policy and Administration
Thomas A. Arcury, Ph.D., Adjunct Associate Professor of Health Behavior and Health Education
Jane A. Armstrong, M.S.W., Clinical Instructor of Social Work
Larry W. Arnold, Ph.D., Research Associate Professor of Microbiology and Immunology
Gavin E. Attell, Ph.D., Research Assistant Professor of Pharmacology
Marilyn K. Atsay, M.S., Adjunct Instructor of Public Health Nursing and Adjunct Instructor of Public Health Leadership Program
Madelin L. Ashley, M.S.N., Adjunct Instructor of Nursing and Dissertation Committee Chair of Exercise and Sport Science
Delton Atkinson, M.P.H., Adjunct Assistant Professor of Biostatistics
William L. Atkinson, M.D., M.P.H., Adjunct Associate Professor of Public Health Leadership Program
William K. Atkinson II, Ph.D., Adjunct Professor of Health Policy and Administration and Adjunct Professor of Public Health Leadership Program
Oscar R. Aylor, Ed.D., Clinical Assistant Professor of Health Policy and Administration
Lynette S. Ayech, Psy.D., Clinical Assistant Professor of Education
Henry A. Azar, Ph.D., M.D., Research Professor of Pathology and Laboratory Medicine
Thomas J. Bacon, Dr.P.H., Clinical Professor of Health Policy and Administration and Clinical Professor of Public Health Leadership Program
James D. Bader, D.D.S., Research Professor of Dentistry and Adjunct Professor of Health Policy and Administration
C. Robert Bagnell Jr., Ph.D., Research Associate Professor of Pathology and Laboratory Medicine
Donald B. Bailey, Ph.D., Professor of Education
Donna W. Bailey, M.S.N., Interim Director of the Center for Teaching and Learning, School of Nursing
Patricia E. Bailey, Dr.P.H., Adjunct Assistant Professor of Maternal and Child Health
Donna D. Baird, Ph.D., Adjunct Associate Professor of Epidemiology
Sridhar Balasubramanian, Ph.D., Adjunct Assistant Professor of Business
Heejung Bang, Ph.D., Research Assistant Professor of Biostatistics
Deborah Bahman, M.S.L.S., Clinical Lecturer of Information and Library Science
Shrillant I. Bangdiwala, Ph.D., Research Associate Professor of Biostatistics
Carolyn J. Barrett, M.P.H., Clinical Assistant Professor of Nutrition
Edward R. Barrett, Ph.D., Visiting Lecturer of Linguistics
Ann L. Barrick, Ph.D., Clinical Associate Professor of Psychology
Warren E. Baunach, Ph.D., Adjunct Professor of Business, Executive Education, Marketing, Competitive Strategy
Pamela S. Bechara, M.S.N., Adjunct Assistant Professor of Nursing
Richard Beane, D.D.S., Clinical Professor of Orthodontics
Peter Bearman, Ph.D., Adjunct Professor of Sociology
Mary A. Beck, M.P.H., Adjunct Associate Professor of Health Policy and Administration
Gerald D. Bell, Ph.D., Adjunct Professor, Leadership, Management, Negotiation, Teamwork
Wilfreda F. Behets, M.P.H., Ph.D., Research Assistant Professor of Medicine and Research Assistant Professor of Epidemiology
Jose Belizan, M.D., Ph.D., Adjunct Professor of Maternal and Child Health
Thomas Behorn, Ph.D., Assistant Professor of Pediatrics
Michael J. Beyea, Ph.D., Research Associate Professor of Nursing
Sarah (Salli) F. Benedict, M.P.H., Lecturer of Health Behavior and Health Education
Vernon Benignus, Ph.D., Research Professor of Psychology
M. Elizabeth Bennett, Ph.D., Adjunct Assistant Professor of Dentistry
Marc L. Berger, M.D., Adjunct Professor of Health Policy and Administration
Jack Bernhardt, M.Phil., Lecturer of Folklore
Mark Bernstein, M.L.S., J.D., Clinical Lecturer of Information and Library Science
Christine S. Berrier, M.S.W., Clinical Instructor of Social Work
Michael A. Berry, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
Michael M. Berry, Ph.D., Research Professor of Business
Laurie Betts, Ph.D., Research Assistant Professor of Pharmacology
Pouru P. Bhwandiwalla, M.D., M.S.P.H., Adjunct Professor of Maternal and Child Health
Michael H. Bigby, Ph.D., Clinical Assistant Professor of Education
Deborah L. Billings, Ph.D., Adjunct Assistant Professor of Health Behavior and Health Education
Richard E. Bilsborrow, Ph.D., Research Professor of Biostatistics and Research Professor of Ecology
Francis S. Binkowski, Ph.D., Adjunct Professor of Environmental Sciences and Engineering
Linda S. Birnbaum, Ph.D., Adjunct Professor of Environmental Sciences and Engineering and Adjunct Professor of Toxicology
Helga Bister, Ph.D., Adjunct Associate Professor of Germanic Languages
Beth Black, M.S.N., Clinical Assistant Professor of Nursing
M. Jean Black, Ph.D., Research Professor of Anthropology
Bonita L. Blake, D.V.M., Ph.D., Research Assistant Professor of Pharmacology
George H. Blakey III, D.D.S., Clinical Assistant Professor of Dentistry
Lynn W. Blanchard, Ph.D., Adjunct Associate Professor of Health Behavior and Health Education
Andrew R. Blight, Ph.D., Research Assistant Professor of Neurobiology
Shelah Bloom, Sc.D., Research Assistant Professor of Maternal and Child Health
Kathryn P. Blue, H.S., Adjunct Instructor of Health Behavior and Health Education
Mary M. Bobbit-Cooke, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Maria L. Bocci, Ph.D., Director of Observational Methods Core at Frank Porter Graham Child Development Center and Research Associate Professor of Psychology, Dissertation Committees of Education, and Dissertation Committees of Neurobiology
Bruce Beeth, Ph.D., Adjunct Professor of Business
Jan Ties Boerma, M.D., Ph.D., Research Associate Professor of Maternal and Child Health
Lyndin W. Bolton, M.S.W., Clinical Instructor of Social Work
Michael S. Booher, M.Ed., Lecturer of Health Behavior and Health Education
Jessica K. Booker, Ph.D., Clinical Assistant Professor of Pathology and Laboratory Medicine
John M. Booker, Ph.D., Adjunct Assistant Professor of Public Health Leadership Program
Gary A. Boorman, D.V.M., Ph.D., Adjunct Associate Professor of Pathology and Laboratory Medicine
Natalie R. Boorman, M.S.W., Clinical Instructor of Social Work
Natasha Bowen, Ph.D., Research Assistant Professor of Social Work
Patricia S. Bowens, Ph.D., Clinical Assistant Professor of Education
J. Michael Bowling, Ph.D., Research Assistant Professor of Health Behavior and Health Education and Adjunct Assistant Professor of Biostatistics
Jeanette M. Boxill, Ph.D., Lecturer of Philosophy
Jose L. Boyer, Ph.D., Research Assistant Professor of Pharmacology
Kerrie E. Boyle, Ph.D., Adjunct Associate Professor of Biostatistics
Charles F. Brantley III, D.D.S., Clinical Associate Professor of Dentistry
Kenneth G. Braxton, B.S., Adjunct Lecturer of Business
Gerard Breart, M.D., M.S., Adjunct Professor of Maternal and Child Health
Amy P. Brewer, Ph.D., Clinical Assistant Professor of Pathology and Laboratory Medicine
Peter J. Brews, Ph.D., Adjunct Assistant Professor of Business
Paul M. Brinich, Ph.D., Clinical Professor of Psychology
Edward F. Brooks, Dr.P.H., Clinical Associate Professor of Health Policy
and Administration
Arnold Brooss, Ph.D., Research Professor of Pharmacy
David J. Brower, J.D., Research Professor of City and Regional Planning
Eleanor Locklin Brown, M.S.W., M.P.H., Clinical Instructor of Social Work
Eric S. Brown, Ph.D., Instructor of Sociology
Fred T. Brown Jr., Ph.D., Adjunct Professor of Health Policy and Administration
Linda Brown, M.S.N., Clinical Assistant Professor of Nursing
Gaylen R. Brubaker, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
Donna M. Bryant, Ph.D., Research Professor of Education
Charles R. Buck Jr., Sc.D., Adjunct Professor of Health Policy and Administration
Kathleen P. Buckheit, M.P.H., Adjunct Instructor of Public Health Nursing
Dawn Carter Buckner, Ph.D., Adjunct Instructor of Health Policy and Administration
Carmen H. Buell, M.R.P., Clinical Professor of Health Policy and Administration and Clinical Professor of Public Health Leadership Program
Paul A. Buescher, Ph.D., Adjunct Associate Professor of Maternal and Child Health
Charles G. Bullock, Ph.D., Research Professor of Education
Margaret R. Burchinal, Ph.D., Research Associate Professor of Psychology
William V. Burlingame, Ph.D., Clinical Professor of Psychology
Charles K. Burnett, Ph.D., Adjunct Assistant Professor of Psychology and Clinical Assistant Professor of Medicine
Scott M. Butler, M.S., Visiting Lecturer of Exercise and Sport Science
Margaret Burnley-Spearmon, Ph.D., Clinical Associate Professor of Social Work
Byron E. Butterworth, Ph.D., Adjunct Professor of Pathology and Laboratory Medicine
John D. Butts, M.D., Clinical Professor of Pathology and Laboratory Medicine
William C. Buxton, M.B.A., Adjunct Lecturer of Business
Virginia M. Buyse, Ph.D., Research Assistant Professor of Education
Jean Livermore Byssse, M.S.W., Clinical Instructor of Social Work
Margaret G. Bye, Ed.D., M.S.N., Clinical Assistant Professor of Nursing
Ralph Byrus, Ph.D., Lecturer of Economics
Craig J. Calhoun, D.P.H., Adjunct Professor of Sociology
Kay N. Campbell, Ed.D., Adjunct Assistant Professor of Public Health Nursing
Robert Cantwell, Ph.D., Adjunct Associate Professor of English
Linda S. Carl, Ph.D., Lecturer of Health Behavior and Health Education
Philip L. Carl, Ph.D., Research Associate Professor of Pharmacology
Dawn Carlson, Ph.D., Research Assistant Professor of Education
Myra Carpenter, Ph.D., Research Assistant Professor of Epidemiology
John Carlson, M.S., Research Associate Professor of Nursing
Hugo F. Castillo, Ph.D., Professor of History
Diane J. Catellier, Ph.D., Research Assistant Professor of Biostatistics
Finis L. Cavender, Ph.D., Adjunct Associate Professor of Toxicology
Joanne S. Caye, M.S.W., Clinical Instructor of Social Work
Kristin Chaffin, M.S.I.S., Clinical Instructor of Information and Library Science
Lloyd E. Chambliss, Ph.D., Research Professor of Biostatistics
Catherine Champagne, Ph.D., Research Assistant Professor of Periodontology
Nila Chatterjee, Research Assistant Professor of Anthropology
Siddhartha Chatterjee, Ph.D., Adjunct Associate Professor of Computer Science
Shao-Yu Chen, Ph.D., Research Assistant Professor of Cell and Developmental Biology
Stacy Chichester, M.S., Clinical Assistant Professor of Dental Ecology
Yen-Feng Chiu, Ph.D., Research Assistant Professor of Biostatistics
John A. Cidlowski, Ph.D., Adjunct Professor of Nutrition, Adjunct Professor of Cell and Molecular Physiology, and Adjunct Professor of Toxicology
Anna K. Clark, Ph.D., Visiting Associate Professor of History
Laura Clark, Ph.D., Clinical Assistant Professor of Psychology
Thomas B. Clark III, M.D., Clinical Associate Professor of Pathology and Laboratory Medicine
Larry D. Clayson, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
Joyce D. Clayton, M.A., Lecturer of Education
Brenda L. Cleary, Ph.D., M.S.N., Adjunct Assistant Professor of Public Health Nursing
Jan P. Clement, Ph.D., Adjunct Professor of Health Policy and Administration
Mark Clodfelter, Ph.D., Professor of Aerospace Studies and Adjunct Professor of History
Laurie D. Coats, Ph.D., Clinical Assistant Professor of Education
Victor A. Coowitch, M.P.H., Adjunct Lecturer of Public Health Leadership
Harvey J. Cohen, M.D., Adjunct Professor of Health Policy and Administration
George P. Cole, Dr.P.H., Clinical Assistant Professor of Social Work
Mary R. Coleman, Ph.D., Clinical Associate Professor of Education
Aidan M. Collins, M.H.A., Adjunct Instructor of Health Policy and Administration
Lane G. Colle, M.S.W., Clinical Assistant Professor of Social Work
M. Carolyn Cooper, Ph.D., M.S.N., Clinical Associate Professor of Nursing
Cynthia F. Copolo, Ph.D., Clinical Assistant Professor of Education
Susan Coppola, M.S., Clinical Assistant Professor of Occupational Science
H. Dickson Corbett III, Ph.D., Research Professor of Education
Jorge D. Courtese, Ph.D., Research Assistant Professor of Cell and Developmental Biology
J. Christopher Courton, Ph.D., Adjunct Assistant Professor of Toxicology
Michael Cory, Ph.D., Adjunct Professor of Pharmacy
Daniel L. Costa, Sc.D., Adjunct Professor of Environmental Sciences and Engineering
James Cotter, Ph.D., Lecturer of Business
Nelson W. Couch, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
Forrest Council, Ph.D., Adjunct Associate Professor of Health Behavior and Health Education
David J. Couper, Ph.D., Research Assistant Professor of Biostatistics
Glynis S. Cowell, Ph.D., Director, Spanish Language Program of Romance Languages
Carol G. Cox, M.P.H., M.S., Adjunct Assistant Professor of Public Health Nursing and Adjunct Assistant Professor of Public Health Leadership Program
John P. Creason, Ph.D., Adjunct Professor of Biostatistics
Theresa L. Cromer, Ph.D., Research Assistant Professor of Environmental Sciences and Engineering
Alan W. Cross, M.D., Adjunct Clinical Professor of Maternal and Child Health
Patricia O'Leary Cunningham, M.P.H., Adjunct Assistant Professor of Public Health Leadership Program
Shannon Currey, Ph.D., Lecturer of Health Behavior and Health Education
Bruce H. Curran, M.A., Adjunct Lecturer of Journalism and Mass Communication
Patricia A D'Amore, Ph.D., M.B.A., Senior Scientist of Genetics and Molecular Biology
Kathleen Dalton, Ph.D., Research Assistant Professor of Health Policy and Administration
Janet Dal Santo, Dr.PH., Lecturer of Health Behavior and Health Education
Charles C. Daniel III, Ph.D., Adjunct Professor of Geological Sciences
C. William Davis, Ph.D., Research Associate Professor of Cell and Molecular Physiology
Leslie Davis, M.S.N., Clinical Assistant Professor of Nursing
Mary Davis, Dr.PH., Lecturer of Health Behavior and Health Education
Nancy L. Davis, Ph.D., Research Associate Professor of Microbiology and Immunology
Sonia M. Davis, Ph.D., Adjunct Assistant Professor of Biostatistics
R. P. Stephen Davis Jr., Ph.D., M.A., Research Archaeologist of Anthropology
Steven A. Day, M.C.P., Clinical Instructor of Social Work
Travis Day, Ph.D., Lecturer of Business
Konstantina Dedi, D.D.S., Assistant Professor of Prosthodontics
Joseph DeGraft-Johnson, Dr.PH., Adjunct Assistant Professor
David M. DeMartini, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
John M. Dement, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
Melissa DeRosier, Ph.D., Research Assistant Professor of Psychology
Robert F. DeVellis, Ph.D., Research Professor of Health Behavior and Health Education and Research Associate Professor of Psychology
Robert Devlin, Ph.D., Adjunct Assistant Professor of Toxicology
Nancy S. Dickinson, Ph.D., Clinical Professor of Social Work
Levinus A. Dieleman, M.D., Ph.D., Research Assistant Professor of Medicine and Dissertation Committees of Cell and Molecular Physiology
Laurel E. Dieter, M.A., Lecturer of Mathematics
Anthony Disser, M.S.N., Adjunct Assistant Professor of Nursing
Caroline W. Doherty, M.P.H., M.S.W., Adjunct Assistant Professor of Maternal and Child Health
Jim P. Doherty, Ph.D., Adjunct Assistant Professor of Health Policy and Administration
Kathleen C. Dorsey, Ph.D., Research Assistant Professor of Epidemiology
William Dow, M.D., Adjunct Assistant Professor of Health Behavior and Health Education
Lisa A. Draper, M.S.W., Visiting Clinical Instructor of Social Work
Elisabeth Driscoll, Ph.D., Lecturer of Anthropology
John E. Drusedow, Ph.D., Clinical Assistant Professor of Information and Library Science
Richard D. Druker, J.D., M.S., Associate Professor of Government
Dean F. Duncan III, Ph.D., Research Associate Professor of Social Work
Charles Dunn, M.S., Lecturer, Department of Operations Research
Paul F. Dunn, M.S.N., Adjunct Assistant Professor of Nursing
R. Joel Dunn, M.S., Adjunct Instructor of Information and Library Science
Carol Duthm, M.S.N., Clinical Associate Professor of Nursing
Michelle L. Dylan, Ph.D., Clinical Instructor of Social Work
Deborah J. Ecker-Rich, Ph.D., Clinical Assistant Professor of Education
Herbert Edelbrunner, Ph.D., Adjunct Professor of Computer Science
Rebecca Edmondson Petzel, Ph.D., Clinical Assistant Professor of Education
Thomas Eling, Ph.D., Adjunct Associate Professor of Toxicology
Christopher Elkins, Ph.D., Research Associate Professor of Microbiology and Immunology
John Elter, D.D.S., Research Assistant Professor of Dental Ecology
Gerald A. Emerson, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
Saundra E. Endress, Ed.D., Clinical Assistant Professor of Public Health Nursing and Clinical Assistant Professor of Public Health Leadership Program
J. Nicholas England, E.E., Adjunct Research Professor of Computer Science
Sheila Englhardt, M.Ed., Clinical Assistant Professor of Nursing
David S. Ersner, Ph.D., Adjunct Professor of Environmental Sciences and Engineering
Kelly R. Everson, Ph.D., Research Assistant Professor of Epidemiology
Mark D. Everson, PhD, Clinical Associate Professor of Psychiatry and Clinical Associate Professor of Psychology
Mary Evers-Soto, PhD, Clinical Assistant Professor of Psychology
John G. Eyles, Ph.D., Adjunct Research Associate Professor of Computer Science
Anita M. Fait, Dr.PH., M.S.W., Clinical Professor of Maternal and Child Health
Thomas W. Farmer, Ph.D., Research Associate Professor of Psychology and Interim Director of the Center for Developmental Science of Psychology
Beverly Ferreira, Ph.D., Clinical Associate Professor of Nursing
John R. Feussner, M.D., Adjunct Professor of Health Policy and Administration
Eliezer Fich, Ph.D., Adjunct Assistant Professor of Business
Thomas H. Fischer, Ph.D., Research Associate Professor of Pathology and Laboratory Medicine
Tekola Fisseha, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Douglas C. Fitzpatrick, Ph.D., Research Assistant Professor of Cell Biology and Anatomy
Stephen G. Flanagan, Ph.D., Clinical Associate Professor of Psychology
Robert L. Flawelling, Ph.D., Adjunct Assistant Professor of Health Behavior and Health Education
Jodan A. Flick, M.S.S.W., Clinical Instructor of Social Work
Susan C. Hadler, M.D., Adjunct Assistant Professor of Pathology and Laboratory Medicine
Charles Haines, Ph.D., Lecturer of Anthropology
Mary Alice Hall, M.S.N., Clinical Assistant Professor of Nursing
Denise D. Hallfor, Ph.D., Research Associate Professor of Maternal and Child Health
Robert M. Hammer, Ph.D., Research Associate Professor of Biostatistics
Rosalie H. Hammond, Ph.D., Clinical Assistant Professor of Nursing
Philip E. Hamrick, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
Dawna Han, Ph.D., Research Associate Professor of Physics and Astronomy
Rosa Haritos, Ph.D., Adjunct Assistant Professor of Sociology
Christina A. Harlan, M.A., Research Instructor of Public Health Leadership Program
Thelma O. Harris, Ph.D., Research Professor of Education
Dean M. Harris, J.D., Clinical Associate Professor of Health Policy and Administration
Perry W. Harrison, Ph.D., M.Ed., Clinical Associate Professor of Education
G. Jean Harry, Ph.D., Adjunct Assistant Professor of Toxicology
Andrew Harr, M.L.S., Adjunct Instructor of Information and Library Science
Elaine Hart-Brothers, M.D., M.P.H., Adjunct Assistant Professor of Maternal and Child Health
Mark E. Hartmann, Ph.D., Adjunct Associate Professor of Operations Research
J. Ronald Hass, Ph.D., Adjunct Professor of Environmental Sciences and Engineering and President and Chief Executive Officer of Chemistry
Bil Haynes, M.A., Adjunct Instructor of Information Science
Mark Haythorn, Ph.D., Adjunct Assistant Professor of Speech and Hearing Sciences
Milan J. Hazucha, M.D., Ph.D., Research Associate Professor of Medicine and Research Associate Professor of Toxicology
Henry D. Heck, Ph.D., Adjunct Associate Professor of Toxicology
Elizabeth G. Hedgcoth, Ed.D., M.Ed., Adjunct Assistant Professor of Exercise and Sport Science
Tracy M. Heenan, D.V.M., Research Assistant Professor of Pathology and Laboratory Medicine
Mark T. Heise, Ph.D., Research Assistant Professor of Microbiology and Immunology
Jennifer A. Hemingway, Lecturer of Social Work
Bruce B. Henderson, Visiting Professor of Social Work
Martha L. Henderson, D.M., Clinical Assistant Professor of Nursing
Nancy S. Henley, M.D., Adjunct Instructor of Health Policy and Administration
Eric Henry, Ph.D., Lecturer of Anthropology
Anna M. Henson, Ph.D., Research Professor of Genetics and Molecular Biology
Marcia E. Herman-Giddens, Dr.P.H., Adjunct Professor of Maternal and Child Health
Mary E. Hernandez, M.A., Lecturer of Social Work
Carmen M. Hernandez-Pelletier, M.P.H., Adjunct Instructor of Health Behavior and Health Education
James Louis Hevia, Ph.D., Adjunct Associate Professor of History
John L. S. Hickey, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
Deborah C. Higdenberg, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Dennis G. Hillenbrand, D.D.S., Adjunct Clinical Associate Professor of Dentistry
Markus Hilpert, Dr.-Ing., Research Assistant Professor for Environmental Sciences and Engineering
Elliot L. Hirshman, Ph.D., Research Professor of Psychology
R. Timothy Hitchcock, M.S.P.H., Adjunct Associate Professor of Environmental Sciences and Engineering
Kenneth L. Hoodley, Ph.D., Adjunct Professor of Business
Marcia Metzgar Hobbs, Ph.D., Research Associate Professor of Medicine and Research Professor of Microbiology and Immunology
Kathleen Hoffman, Ph.D., Adjunct Assistant Professor of Health Behavior and Health Education
John E. Hogan, Ph.D., Adjunct Assistant Professor of Business
Susan Lynn Hogue, Pharm.D., M.P.H., Adjunct Assistant Professor of Health Policy and Administration
Gregory Hohn, B.A., Adjunct Lecturer of Business
Anita P. Holmes, J.D., M.P.H., Adjunct Assistant Professor of Health Behavior and Health Education
Sharon M. Holmes, M.S.W., Clinical Instructor of Social Work
Patrick L. Holt, M.F.A., Lecturer of Dramatic Art
Frederick K. Hornan, Ph.D., Adjunct Assistant Professor of Health Policy and Administration
Leonard Homer, B.A., Visiting Lecturer of Business
Jau-Shyong Hong, Ph.D., Adjunct Associate Professor of Toxicology
Gary Hook, Ph.D., Adjunct Professor of Toxicology
Daniel Hooker, Ph.D., Adjunct Assistant Professor of Exercise and Sport Science
Celia R. Hooper, Ph.D., Clinical Professor of Speech and Hearing Sciences
Matthew L. Hopfensperger, D.D.S., Clinical Assistant Professor of Prosthodontics
James D. Hosking, Ph.D., Research Associate Professor of Biostatistics
Richard M. House, Ph.D., Clinical Associate Professor of Public Health Leadership Program
Alan K. Howe, Ph.D., Research Assistant Professor of Pharmacology
Christine B. Howell, M.P.A., Clinical Instructor of Social Work
Jonathan B. Howes, M.R.P., M.P.A., Adjunct Professor of Public Policy and Adjunct Professor of City and Regional Planning
Daniel M. Huff, Ph.D., Clinical Associate Professor of Education
E. Sidney Hunter III, Ph.D., Adjunct Assistant Professor of Toxicology
Gail S. Huntington, Ph.D., Research Associate Professor of Education
Harry L. Hurd, Ph.D., Adjunct Professor of Statistics
Jon M. Hussey, Ph.D., M.P.H., Research Assistant Professor of Maternal and Child Health
Sara L. Huston, Ph.D., Research Assistant Professor of Epidemiology
William D. Ilgen, Ph.D., Latin American and Iberian Resources Bibliographer Collection Development for the Department of Romance Languages
Susan H. Icons, Ph.D., Adjunct Assistant Professor of Business
Shawn Jackson, B.A., Lecturer in Information and Library Science
Sarah F. Jaggar, M.A., Adjunct Instructor of Health Policy and Administration
Laura Jansen, R.D.H., M.S., Clinical Associate Professor of Dentistry
William H. Jansen II, Ph.D., Research Associate Professor of Anthropology
Hannelore F. Jarausch, Ph.D., Director of French Language Program, Romance Languages Department
Sandra Jarr, M.S.N., Director of Critical Care Services, UNC Hospitals
Vanessa J. Jeffries, M.Ed., Adjunct Instructor of Health Behavior and Health Education
Robert M. Jenkins, Ph.D., Chair of Curriculum in Russian and East European Studies and Adjunct Professor of International and Area Studies
Christian Jobin, Ph.D., Research Assistant Professor of Medicine
Josephine Johns, Ph.D., Adjunct Assistant Professor of Psychology
F. Reed Johnson, Ph.D., Adjunct Professor of Public Policy
Valen E. Johnson, Ph.D., Adjunct Professor of Statistics
Marion Johnson-Thompson, Ph.D., Adjunct Professor of Maternal and Child Health
Douglas A. Johnston, J.D., Adjunct Instructor of Health Policy and Administration
Lia B. Johnston, M.S., PT, Clinical Assistant Professor of Physical Therapy
David H Jolly, Dr.P.H., Adjunct Assistant Professor of Health Behavior and Health Education
Nicole Jones, Ph.D., Clinical Assistant Professor of Psychology
Paul Jones, M.F.A., Clinical Instructor and Director of iibiliio, School of Journalism and Mass Communication and School of Information and Library Science
Rhondette Jones, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Dennis Ray Joyner, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Cynthia C. Julich, M.S.N., Clinical Instructor of Nursing
Zahra B Kamarei, MLS, Adjunct Instructor of Information and Library Science
B. Ed Kanoy Jr., D.D.S., Clinical Professor of Prosthodontics
Berton H. Kaplan, Ph.D., Professor of Epidemiology
Norman L. Kaplan, Ph.D., Adjunct Professor of Biostatistics
Jane Kaufman, M.S.N., Clinical Assistant Professor of Nursing
Barbara R. Keith, Ph.D., Clinical Assistant Professor of Education
Edward F. Kelly, Ph.D., Research Associate Professor of Dentistry
Kristine S. Kelsey, Ph.D., Research Assistant Professor of Nutrition
Malcolm Kendall, M.B.A., Adjunct Lecturer of Business
Martin Stuart Kendal-Reed, Ph.D., Research Assistant Professor of Psychology
Patricia K. Kerig, Ph.D., Clinical Associate Professor of Psychology
Amin A. Khalil, M.P.H., Adjunct Assistant Professor of Health Behavior and Health Education
David C. Kibbe, M.D., M.B.A., Adjunct Assistant Professor of Health Policy and Administration
Frederick G. Kilgour, L.H.D., L.L.D., Distinguished Research Professor of Information and Library Science
Richard Killingsworth, Ph.D., Research Associate Professor of Health Behavior and Health Education
Hyung-Suk Kim, Ph.D., Research Associate Professor of Pathology and Laboratory Medicine
Ilana M. Kingsley, M.L.S., Clinical Instructor of Information and Library Science
Linda Kinsey, M.D., M.P.H., Lecturer of Health Behavior and Health Education
Cassandra Kircher, Ph.D., Instructor of Public Administration
Raymond S. Kirk, Ph.D., Clinical Professor of Social Work
Donald T. Kirkendall, Ph.D., Clinical Assistant Professor of Exercise and Sport Science
Grace E. Kisling, Ph.D., Adjunct Associate Professor of Biostatistics
Anne Klinefelter, M.L.S., J.D., Clinical Lecturer of Information and Library Science
Lynn K. Knauff, M.S.P.H., Adjunct Associate Professor of Maternal and Child Health
Hasan Koc, Ph.D., Postdoctoral Research Associate of Environmental Sciences and Engineering
Julia K. Koch, M.I.S., Lecturer of Information and Library Science
Martin Kohlmeier, M.D., Research Professor of Nutrition
Beverly H. Kolter, Ph.D., Research Assistant Professor of Genetics and Molecular Biology
Thomas R. Konrad, Ph.D., Research Professor of Health Policy and Administration and Dissertation Committee of Epidemiology
Richard Kouri, Ph.D., Adjunct Professor of Business
Mary G. Kovar, Ph.D., Adjunct Professor of Health Policy and Administration
Corinne Krupp, Ph.D., Adjunct Assistant Professor of Business
Eileen C. Kugler, M.S.N., M.P.H., Adjunct Assistant Professor of Maternal and Child Health
Hian Sian Kwa, D.D.S., Clinical Assistant Professor of Prosthodontics
David K. La, Ph.D., Research Assistant Professor of Environmental Sciences and Engineering
William S. Lachicotte Jr., Ph.D., Adjunct Assistant Professor of Anthropology
Sally Laliberte, M.S.N., Adjunct Assistant Professor of Nursing
David S. Lalush, Ph.D., M.S.E.E., Visiting Research Assistant Professor, Adjunct Research Assistant Professor of Biomedical Engineering
Wendy K.K. Lam, Ph.D., Clinical Assistant Professor of Education
Michael C. Lambert, Ph.D., Assistant Professor of African and Afro-American Studies and Adjunct Assistant Professor of Anthropology
Selden Durgan Lamoureux, M.S.L.S., Clinical Instructor of Information and Library Science
Valerie A. Lawder, A.A., Lecturer of Journalism and Mass Communication
Jock G. Lauffer, B.A., Lecturer and Director of Carolina Community Media Project, School of Journalism and Mass Communication
Barbara L. Leach, Clinical Instructor of Social Work
Sheila Leatherman, M.S.W., Adjunct Professor of Health Policy and Administration
Chung-Suk Charles Lee, M.D., Clinical Assistant Professor of Nutrition
Virginia S. Lee, Ph.D., Research Assistant Professor of Education
Jennifer Leeman, Dr.P.H., Research Assistant Professor of Nursing
Jack K. Leiss, Ph.D., Adjunct Assistant Professor of Maternal and Child Health
Ronald L. Mangum, M.A., Clinical Instructor of Social Work
Howard Maniloff, Ed.D., Clinical Associate Professor of Education
Arlane Margolis, Ph.D., Clinical Associate Professor of Psychology
Stuart Marks, Ph.D., Research Professor of Anthropology
Robert R. Maronpot, D.V.M., M.P.H., Adjunct Professor of Pathology and Laboratory Medicine
Donald D. Marples, Sc.D., Adjunct Lecturer of Business
Stephen W. Marshall, Ph.D., Research Assistant Professor of Epidemiology and Research Assistant Professor of Exercise and Sport Science
Victor Marshall, Ph.D., Adjunct Professor of Health Behavior and Health Education
Glen A. Martin, Ph.D., Clinical Assistant Professor of Education
Stanley J. Martinkosky, Ph.D., Clinical Associate Professor of Speech and Hearing Sciences, Emeritus
Sharon P. Maskel, Ed.D., Clinical Assistant Professor of Education
Ronald P. Mason, Ph.D., Adjunct Associate Professor of Toxicology
Edward Massaro, Ph.D., Adjunct Professor of Toxicology
Jimmy R. Massey, Ph.D., Adjunct Associate Professor of Biology, Emeritus
David B. Matchar, M.D., Adjunct Associate Professor of Health Policy and Administration
Kelly L. Maxwell, Ph.D., Clinical Assistant Professor of Education
Paul B. Mayer, B.A., Adjunct Lecturer of Business
Carolyn Mayo, Ph.D., Adjunct Associate Professor of Speech and Hearing Sciences
Andrew D. McBride, M.D., Adjunct Professor of Maternal and Child Health
Colleen M McBride, Ph.D., Adjunct Associate Professor of Health Behavior and Health Education
Karen A. McCall, M.B.A., Adjunct Instructor of Health Policy and Administration
Roger McClellan, M.S., D.V.M., Adjunct Professor of Toxicology
Mark A. McCombs, M.S., Lecturer of Mathematics
David T. McCoy, J.D., M.P.H., Adjunct Assistant Professor of Health Behavior and Health Education
Karen L. McGuiloch, M.S., Clinical Assistant Professor of Physical Therapy
Stephen R. McDow, Ph.D., Adjunct Research Assistant Professor of Environmental Sciences and Engineering
Rosemary McKaig, Ph.D., Research Assistant Professor of Dentistry
Karen McKeenan, Ph.D., Research Assistant Professor of Microbiology and Immunology
Curtis Perry McLaughlin, Ph.D., Adjunct Professor of Business
Kenneth McIver, Ph.D., Adjunct Professor of Health Behavior and Health Education
James T. McLaughlin, Ph.D., Research Assistant Professor of Pharmacology
Robert K. McMahan Jr., Ph.D., Adjunct Associate Professor of Physics and Astronomy
John D. McMahon, M.A., Clinical Instructor of Social Work
Timothy J. McMillan, Ph.D., Adjunct Assistant Professor of Education
Janey S. McMillen, Ph.D., Clinical Assistant Professor of Education
Charles B. McNamara, Ph.D., Adjunct Associate Professor of Information and Library Science
David N. McNeil, Ph.D., Adjunct Professor of Environmental Sciences and Engineering
Robert A. McWilliam, Ph.D., Research Associate Professor of Education
Rick B. Meeker, Ph.D., Research Professor of Neurology and Dissertation Committees of Neurobiology
Marie C. Mielis, M.S., Adjunct Associate Professor of Maternal and Child Health
Vikas Mehrotra, Ph.D., Adjunct Associate Professor of Business
Andrea Meier, Ph.D., Clinical Associate Professor of Social Work
Cathy Melvin, Ph.D., Research Associate Professor of Maternal and Child Health
Thomas E. Metzger, M.A., Lecturer of Education
Robert E. Meyer, Ph.D., M.P.H., Adjunct Associate Professor of Maternal and Child Health
Roland E. Mhlanya, M.P.H., Dip.MCH, Adjunct Assistant Professor of Maternal and Child Health
Mabel M. Miguel, Ph.D., Adjunct Associate Professor of Business
Thelma J. Mielmes, M.S., Clinical Assistant Professor of Physical Therapy
Kiyoshi Miki, Ph.D., Research Assistant Professor of Cell and Developmental Biology
Brent V. Miller, Ph.D., Research Assistant Professor of Geological Sciences
Jeri R. Miller, Ph.D., Clinical Assistant Professor of Pathology and Laboratory Medicine
Margaret M. Miller, Ph.D., Assistant Dean and Clinical Assistant Professor of Nursing
Myrna A. Miller, J.D., M.S.W., Clinical Instructor of Social Work
Richard L. Miller, Ph.D., Adjunct Professor of Pharmacy
Herman E. Mitchell, Ph.D., Adjunct Professor of Biostatistics
Margaret E. Molloy, Dr.P.H., Adjunct Assistant Professor of Public Health Leadership Program
Steven E. Moir, Ph.D., Adjunct Associate Professor of Computer Science
Karen A. Monaco, M.S., Adjunct Instructor of Health Behavior and Health Education
Bill Moore, Ph.D., Adjunct Professor of Business
Murry-K Moos, M.P.H., F.N.P., Adjunct Associate Professor of Maternal and Child Health
K. Elizabeth Moreau, Ph.D., M.P.H., Research Assistant Professor of Maternal and Child Health
Kevin T. Morgan, Ph.D., Adjunct Associate Professor of Pathology and Laboratory Medicine
Neil Morgan, Ph.D., Adjunct Assistant Professor of Business
Susan Morris-Natschke, Ph.D., Research Associate Professor of Pharmacy
Charles S. Morrison, Ph.D., Adjunct Assistant Professor of Health Behavior and Education and Dissertation Committees of Epidemiology
Anne L. Morisseau, M.S., Clinical Lecturer of Information and Library Science
Joseph P. Morrissey, Ph.D., Adjunct Professor of Health Policy and Administration
Margaret L. Morse, Clinical Assistant Professor of Social Work
Nicholas G. Moss, Ph.D., Research Associate of Cell and Molecular Physiology
Constance F. Mullinix, Ph.D., Adjunct Assistant Professor of Public Health Nursing and Adjunct Assistant Professor of Public Health Leadership Program
Michl Mumma, B.A., Visiting Lecturer of Business
Michael C. Munger, Ph.D., Adjunct Professor of Public Policy
Priscilla Murphy, Ph.D., Clinical Instructor of Information and Library Science
Sharon C. Murray, Ph.D., Research Assistant Professor of Biostatistics
Charles R. Myers, M.B.A., Visiting Lecturer of Business
Barbara W. Myers, M.S.W., M.Ed., Lecturer of Education
Denise Nadeau, M.D., M.P.H., Adjunct Assistant Professor of Maternal and Child Health
Jun Nakamura, Ph.D., D.V.M., Research Assistant Professor of Environmental Sciences and Engineering
Dennis F. Naugle, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
David A. Neal, M.B.A., Visiting Lecturer of Business
Edward M. Neal, Ph.D., Research Assistant Professor of Education
Lucas M. Neus, Sc.D., Adjunct Associate Professor of Epidemiology
Stephen C. Nesnow, Ph.D., Adjunct Professor of Pathology and Laboratory Medicine
Paul Nettesheim, M.D., Adjunct Professor of Pathology and Laboratory Medicine
Rachel T. Nobel, Ph.D., Adjunct Professor of Environmental Sciences and Engineering
Catherine Nielson, M.P.H., Clinical Associate Professor of Occupational Science
Daniel L. Norwood, Ph.D., Adjunct Assistant Professor of Environmental Sciences and Engineering
Harry A. Nuskin, Ph.D., Adjunct Professor of Health Policy and Administration
Lars S. Nyland, Ph.D., Research Associate Professor of Computer Science
Diana Obein, Ph.D., Adjunct Professor of Business
Paul T. O'Connor, M.A., Lecturer of Journalism and Mass Communication
Patrick Oglesby, J.D., Lecturer of Business
Ann Marie O'Hare, M.P.H., Clinical Assistant Professor of Nursing
Jack Olin, Ph.D., Adjunct Professor of Business
Timothy Oliver, Ph.D., Research Assistant Professor of Cell and Developmental Biology
John C. Olsen, M.D., Assistant Professor of Medicine, Adjunct Assistant Professor of Pharmacology, and Research Assistant Professor of Genetics and Molecular Biology
Michael S. O'Malley, Ph.D., Adjunct Associate Professor of Health Policy and Administration
Sonna Oppewal, Ph.D., Associate Dean for Clinical Affairs and Clinical Assistant Professor of Nursing
Stephen N. Orton, Ph.D., Adjunct Assistant Professor of Health Policy and Administration
Shojo Oshima, Ph.D., Research Associate Professor of Cell and Developmental Biology
Judith S. Ostendorf, M.P.H., Clinical Instructor of Public Health Nursing
Vickie P. Overman, M.Ed., Clinical Associate Professor of Dentistry
Stephanie J. Padilla, Ph.D., Adjunct Associate Professor of Toxicology
John S. Painter, Ph.D., Clinical Assistant Professor of Social Work
Gary S. Palmer, M.H.A., Associate Director and Clinical Instructor of Health Policy and Administration
James H. Palmer, Ed.D., Clinical Assistant Professor of Social Work
Susan Palmer, Ph.D., Adjunct Assistant Professor of Business
Stephanie Pandolfi, Lecturer of Anthropology
Nalin R. Parikh, Ph.D., Research Associate Professor of Physics and Astronomy and Research Associate Professor of Materials Science
Mallie J. Pastall, Ph.D., M.P.H., Adjunct Assistant Professor of Health Behavior and Health Education
Richard S. Paules, Ph.D., Adjunct Associate Professor of Pathology and Laboratory Medicine
Norman A. Peart, Ph.D., Instructor of Sociology
Neil G. Pedersen, Ph.D., Clinical Associate Professor of Education
María L. Peña, M.S., Clinical Instructor of Social Work
Mary D. Peoples-Sheps, Dr.P.H., Adjunct Associate Professor of Public Health Nursing and Adjunct Associate Professor of Maternal and Child Health
Jane Perkins, J.D., M.P.H., Adjunct Associate Professor of Law and Visiting Clinical Associate Professor of Social Work
Mary Ann Peters, Ph.D., M.S.N., Clinical Assistant Professor of Nursing
Robert M. Petersen, Ph.D., Research Professor of Psychology
Ruth Petersen, M.D., M.P.H., Lecturer of Maternal and Child Health
Charlotte Peterson, M.S., Assistant Clinical Professor of Dental Ecology
Andrew V. Perks, B.S., Adjunct Assistant Professor of Environmental Sciences and Engineering
Meredith Busby Petchauer, M.A., Lecturer of Exercise and Sport Science
Regina Y. Petteway, M.S.P.H., Adjunct Instructor of Health Behavior and Health Education
Mary Pettiette, D.D.S., Clinical Associate Professor of Dentistry
Celh Phillips, Ph.D., Research Professor of Orthodontics
Terrence K. Pierson, Ph.D., Adjunct Assistant Professor of Environmental Sciences and Engineering
Joseph Pinto, Ph.D., Adjunct Associate Professor of Environmental Sciences and Engineering
Gordon F. Pitt, Ph.D., Visiting Professor of Psychology
Craig Pohlman, Ph.D., Clinical Assistant Professor of Education
Christopher J. Portier, Ph.D., Adjunct Professor of Biostatistics
James V. Porto Jr., Ph.D., Clinical Assistant Professor of Health Policy and Administration
David D. Potenziani, Ph.D., Adjunct Assistant Professor of Health Policy and Administration
John Poultton, Ph.D., Adjunct Research Professor of Computer Science
John S. Preisser, Ph.D., Research Assistant Professor of Biostatistics
Paul W. Pendrive, Ph.D., Adjunct Professor of Environmental Sciences and Engineering
Edward G. Pringle, Ph.D., Adjunct Lecturer of Business
James W. Putney Jr., Ph.D., Adjunct Professor of Pharmacology
Timothy D. Pyatt, M.L.S., Adjunct Instructor of Information and Library Science
Ting Qian, Ph.D., Research Assistant Professor of Cell and Developmental Biology
Stephen R. Quint, Ph.D., Research Associate Professor of Biomedical Engineering
Donna J. Rabine, Ph.D., Adjunct Assistant Professor of Health Policy and Administration
Linda R. Rahija, M.A., M.S.W., Clinical Instructor of Social Work
Elizabeth W. Randall-David, Ph.D., Adjunct Assistant Professor of Health Behavior and Health Education and Adjunct Assistant Professor of Public Health Leadership Program
Scott H. Randall, Ph.D., Research Assistant Professor of Cell and Molecular Physiology
Susan A. Randolph, M.S.N., Adjunct Instructor of Public Health Nursing and Adjunct Instructor of Public Health Leadership Program
David Rankin, B.A., Adjunct Instructor of Information and Library Science
Kelly B. Reath, D.P.A., Clinical Associate Professor of Social Work
Leslie Recio, Ph.D., Adjunct Assistant Professor of Toxicology
Martha Reeves, Ph.D., Adjunct Professor of Business
Marie A. Reilly, Ph.D., Clinical Associate Professor of Physical Therapy
Daniel B. Reimer, M.P.H., Adjunct Instructor of Health Policy and Administration
Wanda F. Reives, M.S.W., Clinical Instructor of Social Work
Jacqueline C. Remnick, B.S., Lecturer of Maternal and Child Health
Kenneth A. Rehm, Dr.P.H., Adjunct Professor of Health Policy and Administration
Dennis A. Revicki, Ph.D., Adjunct Professor of Health Policy and Administration
Amir Rezvani, Ph.D., Research Associate Professor of Social Work
Barbara H. Rhoades, M.A.T., M.F.A., Clinical Instructor of Education
David B. Richardson, Ph.D., Research Assistant Professor of Epidemiology
Richard T. Richardson, Ph.D., Research Assistant Professor of Cell and Developmental Biology
Douglas E. Rickert, Ph.D., Adjunct Associate Professor of Toxicology
Diana E. Rickert, J.D., Adjunct Instructor of Health Policy and Administration
Brett Riggs, Ph.D., Adjunct Assistant Professor of Anthropology
Barbara K. Rimer, Dr.P.H., Adjunct Professor of Health Behavior and Health Education
Christopher Ringwalt, Dr.P.H., M.S.W., Adjunct Associate Professor of Health Behavior and Health Education
Emily J. Rivenbark, M.A.Ed., Adjunct Instructor of Public Health Nursing and Adjunct Instructor of Public Health Leadership Program
William C. Rivenbark, Ph.D., M.P.A., Lecturer of Public Administration
Terry L. Roberts, Ph.D., Clinical Assistant Professor of Education
Douglas H. Robertson, Ph.D., Research Associate Professor of Health Behavior and Health Education
Kevin Robertson, Ph.D., M.A., Research Associate Professor of Psychology
Sara H. Robicheaux, Ph.D., Adjunct Assistant Professor of Business
Leslie A. Robinson, M.S.A., Adjunct Lecturer of Business
Robert N. Rodriguez, Ph.D., Adjunct Associate Professor of Statistics
Christine L. Rogers, C.A.S., Clinical Instructor of Education
John M. Rogers, Ph.D., Adjunct Associate Professor of Toxicology
Katherine J. Roggenskamp, M.A., Research Instructor of Biostatistics
Ryan M. Rohm, Ph.D., Adjunct Associate Professor of Physics and Astronomy
Michael J. Roller, M.F.A., Adjunct Assistant Professor of Dramatic Art
LaHoma S. Romocki, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Kathryn M. Rose, Ph.D., Research Assistant Professor of Epidemiology
Margie E. Rose, M.S.P.H., Adjunct Associate Professor of Maternal and Child Health
Cherie A. Rosemond, M.S., Clinical Associate Professor of Exercise and Sport Science and Clinical Associate Professor of Physical Therapy
Angela E. Rosenberg, Dr.P.H., Instructor of Physical Therapy
Stephanie J. Rowley, Ph.D., Research Assistant Professor of Psychology
Partha Roy, Ph.D., Research Assistant Professor of Cell and Developmental Biology
Julia Searl Rustet, Ph.D., Clinical Assistant Professor of Social Work
Kevin J. Ryan, M.D., M.P.H., Adjunct Associate Professor of Maternal and Child Health
Ibrahim A. Salama, Ph.D., Adjunct Professor of Biostatistics
Mary Anne P. Salmon, Ph.D., Clinical Associate Professor of Social Work
James M. Samet, Ph.D., M.P.H., Adjunct Assistant Professor of Toxicology
Allen Samuelson, D.D.S., Clinical Assistant Professor of Dentistry
Tamara L. Samuelson, D.D.S., Adjunct Clinical Assistant Professor of Dentistry
Victoria C. Sanchez, Dr.P.H., Clinical Assistant Professor of Health Behavior and Health Education
Dale P. Sandler, Ph.D., Adjunct Assistant Professor of Epidemiology
Timothy R. Sanford, Ph.D., Clinical Associate Professor of Education and Information and Library Science
Ramiah Sangiah, Ph.D., Research Assistant Professor of Environmental Sciences and Engineering
Carolyn I. Sartor, M.D., Assistant Professor of Radiation Oncology and Assistant Professor of Genetics and Molecular Biology
Marjorie A. Satinsky, M.B.A., Adjunct Lecturer of Health Policy and Administration
Roby B. Sawyers, Ph.D., Adjunct Associate Professor of Business
Barry Saunders, Ph.D., Adjunct Assistant Professor of Anthropology
Denise E. Saunders, Ph.D., Clinical Assistant Professor of Education
Lucy A. Savitz, Ph.D., Research Assistant Professor of Health Policy and Administration
John F. Scarry, Ph.D., Research Associate Professor of Anthropology
Klaus O. Schafer, M.D., Adjunct Professor of Public Health Leadership
Stanley A. Schauweker, Ed.D., Clinical Associate Professor of Education
Connie Schardt, M.L.S., Lecturer of Information and Library Science
Michael A. Schell, Ph.D., Research Associate Professor of Biostatistics
Anna P. Schenck, Ph.D., Adjunct Assistant Professor of Health Behavior and Health Education
Anna M. Scheyett, M.S.W., Clinical Assistant Professor of Social Work
Robert C. Schroier, M.S., Clinical Instructor of Health Policy and Administration
Michael D. Schulman, Ph.D., Adjunct Instructor of Health Behavior and Health Education
Heidi Schultz, Ph.D., Adjunct Assistant Professor of Business
Brad Schwarz, Ph.D., Lecturer of Economics
Joel J. Schwartz, Ph.D., University Professor of Distinguished Teaching, Adjunct Professor of Public Policy
Scott Schwartz, Ph.D., Clinical Assistant Professor of Psychology
Todd A. Schwartz, M.S., Research Instructor of Biostatistics
Alberto D. Scotti, Ph.D., Research Assistant Professor of Marine Sciences
Richard P. Scoville, Ph.D., Adjunct Assistant Professor of Health Policy and Administration
Mildred Seelig, M.D., Adjunct Professor of Nutrition
Darlene K. Sekerek, Ph.D., Clinical Associate Professor of Physical Therapy
Mary Jane K. Selgrade, Ph.D., Adjunct Associate Professor of Toxicology
Laurie J. Selz-Campbell, M.A., Clinical Instructor of Social Work
Marc L. Serre, Ph.D., Research Assistant Professor of Environmental Sciences and Engineering
Miriam Sester, Ph.D., Adjunct Assistant Professor of Health Behavior and Health Education
Cynthia Sezler, M.A., Visiting Lecturer of Business
Ken Sexton, Ph.D., Research Associate of Environmental Sciences and Engineering
Phoebe Jo Shackelford, M.P.H., Adjunct Assistant Professor of Maternal and Child Health
Saundra E. Shay, Ed.D., Clinical Assistant Professor of Public Health Nursing
Thomas J. Shay, Ph.D., Research Assistant Professor of Marine Sciences
Christopher M. Shea, M.A., Coordinator for Academic Affairs of Health Policy and Administration
Gwy-Ann Shin, Research Assistant Professor of Environmental Sciences and Engineering
Carl M. Shy, M.D., Dr.P.H., Professor of Epidemiology
Pamela C. Silberman, Dr.P.H., Clinical Associate Professor of Health Policy and Administration
Andrew Silton, M.A., Adjunct Lecturer of Business
Ruth E. Silversmith, Ph.D., Research Assistant Professor of Microbiology and Immunology
Elliot Silverstein, Ph.D., Adjunct Associate Professor of Business
Jane E. Simmons, Ph.D., M.S.P.H., Adjunct Assistant Professor of Environmental Sciences and Engineering
Robert C. Simon, M.D., Adjunct Associate Professor of Health Policy and Administration
Neal R. Simonsen, Ph.D., Research Assistant Professor of Epidemiology
Ross J. Simpson Jr., M.D., Clinical Professor of Epidemiology
Avinash C. Singh, Ph.D., Adjunct Professor of Biostatistics
Beverly A. Sizemore, Ph.D., Clinical Assistant Professor of Education
C.J. Skender, Ph.D., Adjunct Professor of Business
Celine S. Skinner, Ph.D., Adjunct Associate Professor of Health Behavior and Health Education
Debra C. Skinner, Ph.D., Investigator at Frank Porter Graham Child Development Center, Dissertation Committees of Psychology and Adjunct Associate Professor of Anthropology
Steven G. Sloat, M.B.A., Adjunct Associate Professor of Health Policy and Administration
Ralph J. Smialowicz, Ph.D., Adjunct Associate Professor of Toxicology
Eleanor Smith, M.S.L.S., Clinical Lecturer of Information and Library Science
F. Donelson Smith, Ph.D., Research Professor of Computer Science
Jason B. Smith, Ph.D., Adjunct Associate Professor of Health Behavior and Health Education
Paige Smith, Ph.D., Adjunct Assistant Professor of Health Behavior and Health Education
Marjolein B. Smith, Ph.D., Adjunct Assistant Professor of Biostatistics
S. Peter Smith, M.B.A., Lecturer of Business
Sandy Smith-Nenini, Ph.D., Research Assistant Professor of Anthropology
Steven M. Snapinn, Ph.D., Adjunct Associate Professor of Biostatistics
Jennifer Ann Snyder, Ph.D., Clinical Assistant Professor of Psychology
William A. Sollecito, Dr.P.H., Research Professor of Health Policy and Administration, Research Professor of Public Health Leadership Program, and Clinical Associate Professor of Psychology
Geraldine K. Solomon, M.L.S., Clinical Instructor of Information and Library Science
Florence Soltys, M.S.W., Clinical Associate Professor of Social Work
G. Edward Southern Jr., Ph.D., Clinical Assistant Professor of Information and Library Science
Susan Spalt, M.P.H., Adjunct Assistant Professor of Maternal and Child Health
Julie A. Spessard, M.S.W., Clinical Instructor of Social Work
Jozef Spychala, Ph.D., Research Assistant Professor of Pharmacology
Dalene Stangl, Ph.D., Adjunct Assistant Professor of Biostatistics
Donald McVern Stanford Jr., Ph.D., Adjunct Associate Professor of Business
Mark E. Stanton, Ph.D., Adjunct Associate Professor of Information and Library Science and Adjunct Associate Professor of Psychology
Thomas B. Starr, Ph.D., Adjunct Assistant Professor of Environmental Sciences and Engineering
James D. Stasheff, Ph.D., Professor of Mathematics
Jane Stein, Dr.P.H., M.S., Adjunct Associate Professor of Maternal and Child Health
Margot Sein, Ph.D., Ph.D., M.Ed., Clinical Assistant Professor of Psychology
Mareah Stekeely, Ph.D., Clinical Assistant Professor of Psychology
Laurie Steponaitis, Ph.D., Research Assistant Professor of Anthropology
Elizabeth Sein, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Rachel H. Stevens, Ed.D., Clinical Professor of Public Health Leadership Program
Paul W. Stewart, Ph.D., Research Associate Professor of Biostatistics
Tony K. Stewart, Ph.D., Adjunct Associate Professor of Religious Studies
Stephen Stimpson, Ph.D., Adjunct Associate Professor of Medicine
Brian R. Steiner, Ph.D., Adjunct Assistant Professor of Physics and Astronomy
Woodall Stopford, M.D., M.S.P.H., Adjunct Assistant Professor of Environmental Sciences and Engineering
Walter L. Straus, M.D., M.P.H., Fellow in Division of Digestive Diseases and Nutrition in department of Medicine and Clinical Assistant Professor of Epidemiology
Claudia Strauss, Ph.D., Research Associate Professor of Anthropology
Diane C. Strauss, M.S.L.S., Adjunct Professor of Information and Library Science
Sarah L. Strunk, Ph.D., Clinical Instructor of Health Policy and Administration
Konstantin Stykunas, Ph.D., Brauer Research Assistant Professor of Mathematics
Rosemary L. Summers, Dr.P.H., Clinical Assistant Professor of Public Health Leadership Program
Carl W. Swartz, Ph.D., Clinical Assistant Professor of Education
Julie Sweedly, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Nabuyuki Takahashi, M.D., Ph.D., Research Assistant Professor of Pathology and Laboratory Medicine
Douglas Taylor, Ph.D., Research Assistant Professor of Biostatistics
Russell M. Taylor II, Ph.D., Research Associate Professor of Computer Science, Physics and Astronomy, and Applied Materials Sciences
Raymond W. Tennant, Ph.D., Adjunct Associate Professor of Toxicology
David B. Thomas, M.D., Clinical Assistant Professor of Pathology and Laboratory Medicine
Kathleen C. Thomas, Ph.D., Adjunct Assistant Professor of Health Policy and Administration
Margaret S. Thomas, M.H.A., Adjunct Instructor of Health Policy and Administration
A. Christopher Thompson, Ph.D., Adjunct Associate Professor of Physics and Astronomy
Deborah Thompson, Ed.D., Clinical Associate Professor of Nursing
John M. Thorpe Jr., M.D., Clinical Associate Professor of Epidemiology
Nancy L. Tigir, Dr.P.H., Adjunct Assistant Professor of Public Health Nursing and Adjunct Assistant Professor of Public Health Leadership Program
Hugh H. Tilson, M.D., Adjunct Professor of Health Policy and Administration, Adjunct Professor of Epidemiology, Adjunct Professor of Pharmacy, and Adjunct Professor of Social Medicine
Kenneth R. Tindall, Ph.D., Adjunct Associate Professor of Toxicology
Judy Jones Tisdale, Ph.D., Adjunct Assistant Professor of Business
Sue Tollefson- nhận, Ph.D., Research Assistant Professor of Health Policy and Administration
Elizabeth M. Toraquist, M.A., Lecturer of Nursing
Scott L. Tresti, D.V.M., Research Assistant Professor of Pathology and Laboratory Medicine
Bram Tucker, Ph.D., Lecturer of Anthropology
Gail E. Tudor, Ph.D., Clinical Assistant Professor of Biostatistics
Katherine L. Turner, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Emily T. Tyler, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Donald A. Tyndall, Ph.D., Adjunct Professor of Environmental Sciences and Engineering
Herman A. Tyroler, Ph.D., Professor of Epidemiology
Karl Umble, Ph.D., Lecturer of Health Behavior and Health Education
Eugenia A. Upchurch, M.P.H., Adjunct Instructor of Health Behavior and Health Education
Vaughn M. Upshaw, Dr.P.H., D.Ed., M.P.H., Clinical Assistant Professor of Health Policy and Administration and Clinical Assistant Professor of Public Health Leadership Program
Josef J. Vaisman, Ph.D., Research Assistant Professor of Pharmacy
Julia Vatschannoff, M.D., Research Assistant Professor of Cell and Developmental Biology
Peter VanDoren, Ph.D., Adjunct Associate Professor of Public Policy
Michael Van Fossen, M.S., Adjunct Instructor of Information and Library Science
Courtney H. Van Houten, Ph.D., Adjunct Assistant Professor of Health Policy and Administration
Nancy Van Houten, Research Associate Professor of Microbiology and Immunology
Russel Van Wyk, Ph.D., M.A., Lecturer and Assistant Dean of History
Jane K. Vella, Ed.D., Adjunct Assistant Professor of Health Behavior and Health Education
Laandra Vicci, B.S., Director of Microelectronic Systems Laboratory and Lecturer of Computer Science
James E. Vickers, M.A., Research Assistant Professor of Epidemiology and Lecturer of Nursing
Thomas J. Vitaglione, M.Phil., Adjunct Professor of Maternal and Child Health
Constance L. Wakeford, M.S., Clinical Instructor of Occupational Science
Thomas A. Walk, Ph.D., Adjunct Assistant Professor of Health Policy and Administration
Ellen A. Walker, Ph.D., Visiting Research Associate Professor of Psychology and Dissertation Committees of Neurobiology
Nigel J. Walker, Ph.D., Adjunct Assistant Professor of Toxicology
Anna E. Waller, Sc.D., Adjunct Lecturer of Health Behavior and Health Education
Cynthia Wallis-Hill, M.S.W., Clinical Instructor of Social Work
Thomas S. Wallsten, Ph.D., Research Professor of Psychology
Barbara T. Walton, Ph.D., Adjunct Professor of Environmental Sciences and Engineering
Amy Ward, M.A., Adjunct Lecturer of Business
David B. Washburn, Ph.D., Adjunct Assistant Professor of Environmental Sciences and Engineering
Martha F. Waters, M.S.W., Clinical Instructor of Social Work
Michael D. Waters, Ph.D., Adjunct Professor of Toxicology
Karen M. Webb, M.Ed., Adjunct Instructor of Health Behavior and Health Education
Beatt P. Webb-Mitchell, Ph.D., Clinical Assistant Professor of Education
Wendee M. Wechsberg, Ph.D., Adjunct Associate Professor of Health Policy and Administration
Clarice R. Weinberg, Ph.D., Adjunct Professor of Biostatistics
Howard S. Weinberg, D.Sc., Research Assistant Professor of Environmental Sciences and Engineering
Richard Weinberg, Ph.D., Research Associate Professor of Cell and Developmental Biology
Paul S. Weinhold, Ph.D., Research Associate Professor of Orthopaedics and Research Assistant Professor of Biomedical Engineering
Sharon S. Wern, Ph.D., Research Assistant Professor of Epidemiology
Gregory F. Welch, Ph.D., Research Associate Professor of Computer Science
Frank Welch, D.V.M., Adjunct Associate Professor of Toxicology
Liliana Wendolff, Ph.D., Adjunct Assistant Professor of Business
Tracey A. West, M.S., Clinical Instructor of Education
Judy A. White, M.S., Clinical Associate Professor of Physical Therapy
H. P. Whiteside, Ph.D., Research Associate Professor of Health Behavior and Health Education
Alan C. Whitmore, Ph.D., Research Assistant Professor of Dentistry
Mary C. Whitten, M.S., Research Assistant Professor of Computer Science and of Information Science
Russell W. Wiener, Ph.D., Adjunct Assistant Professor of Environmental Sciences and Engineering
Kenneth Wiles, Ph.D., Adjunct Lecturer of Business
Cynthia M. Wiford, M.R.C., Clinical Instructor of Social Work
Judith B. Wildfire, M.A., M.P.H., Research Assistant Professor of Social Work
Rhonda M. Wilkerson, Ph.D., Clinical Associate Professor of Education
Jean W. Wilkins, Ph.D., Clinical Associate Professor of Psychiatry, Clinical Associate Professor of Neurology, and Dissertation Committees of Psychology
Christopher D. Williams, M.D., Clinical Instructor of Obstetrics and Gynecology
Ronald Williams, M.B.A., Adjunct Lecturer of Business
Evelyn S. Williams, Ed.D., M.S.W., Clinical Assistant Professor of Social Work
Jay C. Williams, Ph.D., Clinical Associate Professor of Social Work
William D. Williamson, M.P.H., Instructor of Public Health Nursing
Lynn E. Williford, Ph.D., Adjunct Assistant Professor of Health Policy and Administration and Clinical Assistant Professor of Education
Bobby M. Wilson, M.Env.S., Adjunct Instructor of Environmental Sciences and Engineering
William E. Wilson, Ph.D., Adjunct Professor of Environmental Sciences and Engineering
Ruth E. Wintner, Ph.D., Clinical Assistant Professor of Pathology and Laboratory Medicine
Pamela J. Winston, Ph.D., Research Professor of Education and Dissertation Committees of Public Policy
Roger W. Wiseman, Ph.D., Adjunct Associate Professor of Genetics and Molecular Biology and Adjunct Associate Professor of Pathology and Laboratory Medicine
Alisa Sue Wolsberg, Ph.D., Research Assistant Professor of Pathology and Laboratory Medicine
Douglas C. Wolf, Ph.D., D.V.M., Adjunct Associate Professor of Pathology and Laboratory Medicine
Russell D. Wolfgang, Ph.D., Adjunct Assistant Professor of Biostatistics
Jenny Womack, M.S., Clinical Assistant Professor of Occupational Science
Elizabeth K. Woodard, M.S.N., Clinical Assistant Professor of Nursing
William J. Woodward, Ph.D., Adjunct Assistant Professor of Public Health Leadership
Robert E. Wyatt, Ph.D., Director of the Highlands Biological Station and Professor of Ecology
Anne Smith Worth, M.S.W., Clinical Instructor of Social Work
James W. Yarbrough, Ph.D., Adjunct Assistant Professor of Health Policy and Administration
Elaine Ying Yeh, Ph.D., Research Assistant Professor of Biology
Donna C. Yerby, M.Ed., Clinical Instructor of Education
Clarence N. York, Ed.D., Clinical Professor of Education
Zhi Zhong, Ph.D., Research Assistant Professor of Cell and Developmental Biology
Laura A. Zimmerman, Ph.D., Clinical Associate Professor of Social Work
Irene N. Zipper, Ph.D., M.S.W., Clinical Associate Professor of Social Work, Assistant Professor of Russian and East European Studies, and Clinical Assistant Professor of Education
Fixed-Term Special Appointments

Barbara D. Abbott, Ph.D., Research Biologist for the Reproductive Toxicology Division of the Health Effects Research Laboratory at the United States Environmental Protection Agency, appointed by the Department of Environmental Sciences and Engineering

Sam Adei, M.D., M.P.H., M.Sc., Director, Health Research Unit, Ministry of Health, Ghana, appointed by the Department of Health Policy and Administration

Panik J.M. Albin, Ph.D., Professor, appointed by the Department of Statistics

John H. Aldrich, Ph.D., Professor of Political Science at Duke University, appointed by the Department of Political Science

Lauren B. Alroy, Ph.D., Professor of Psychology at Temple University, appointed by the Department of Psychology

Charlene A. Allred, Ph.D., Associate Professor of Nursing at Duke University, appointed by the School of Nursing

Arthur Anastopoulos, Ph.D., Associate Professor of Psychology at the University of North Carolina at Greensboro, appointed by the School of Nursing

Janice R. Anderson, M.S.N., School Nurse Program Development for Durham County Health Department, appointed by the School of Nursing

Robert Nelson Anderson III, Ph.D., Assistant Professor of Spanish and Portuguese at North Carolina Agricultural and Technical State University, appointed by the Department of Romance Languages

Ruth A. Anderson, Ph.D., M.S.N., Associate Professor of Nursing at the Duke University School of Nursing, appointed by the School of Nursing

Julie T. Andresen, Ph.D., Associate Professor of English and Cultural Anthropology at Duke University, appointed by the Department of Germanic Languages

Edna Andrews, Ph.D., Professor of Linguistics and Cultural Anthropology at Duke University, appointed by the Department of Germanic Languages

Philip J. Arnold III, Ph.D., Associate Professor of Anthropology at Loyola University, appointed by the Department of Anthropology

Richard Arum, Ph.D., Assistant Professor of Sociology at the University of Arizona at Tucson, appointed by the Department of Sociology

Steven R. Asher, Ph.D., Visiting Professor of Psychology at Duke University, appointed by the Department of Psychology

Owen L. Astrachan, Ph.D., Associate Professor of Computer Science at Duke University, appointed by the Department of Computer Science

Paula R. Baksheider, Ph.D., Professor of English at Auburn University, appointed by the Department of English

Richard Baddour, M.A., Director of Athletics, appointed by the Department of Exercise and Sport Science

Jeffrey P. Baker, Ph.D., Assistant Clinical Professor of Pediatrics at Duke University, appointed by the Department of History

Lynne Baker-Ward, Ph.D., Professor of Psychology at North Carolina State University, appointed by the Department of Psychology

Robert L. Balster, Ph.D., Director of the Center for Drug and Alcohol Studies at Virginia Commonwealth University, appointed by the Curriculum in Neurobiology

John Bare, Ph.D., Director of Evaluation, John S. and James L. Knight Foundation, appointed by the School of Journalism and Mass Communication

Morton A. Barfaz, Ph.D., Professor of Civil Engineering at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering

Stanley Barone Jr., Ph.D., Research Biologist for the Cellular and Molecular Neurotoxicology Branch of the United States Environmental Protection Agency, appointed by the Curriculum in Toxicology

John M. Bartley, Ph.D., Professor and Chair of Geology and Geophysics at the University of Utah, appointed by the Department of Geological Sciences

James S. Beard, Ph.D., Associate Professor of Geology at Virginia Polytechnic Institute and State University, appointed by the Department of Geological Sciences

Timothy Beatley, Ph.D., Associate Professor of Urban and Environmental Planning at the University of Virginia, appointed by the Department of City and Regional Planning

D. Fowler Bell III, Ph.D., Professor of Romance Studies at Duke University, appointed by the Department of Romance Languages

Ronny Bell, Ph.D., Assistant Professor of Public Health Sciences at Wake Forest University, appointed by the School of Nursing

Jerry Bernholc, Ph.D., Professor of Physics at North Carolina State University, appointed by the Department of Physics and Astronomy

Tami Biddle, Ph.D., Assistant Professor at Duke University, appointed by the Department of History

Elisa J. Bienenstock, Ph.D., Assistant Professor of Sociology at Stanford University, appointed by the Department of Sociology

Frank Biocca, Ph.D., Professor of Telecommunication Technologies and Information Services at Michigan State University, appointed by the School of Journalism and Mass Communication

Paul F. Bitting, Ph.D., Associate Professor of Education at North Carolina State University, appointed by the School of Education

Jonathan T. Blackburn, M.S., Doctoral Student in Human Movement Science, appointed by the Department of Exercise and Sport Science

Carole Blair, Ph.D., Professor of American Studies at the University of California-Davis Washington Center, appointed by the Department of Communication Studies

Jackson O. Blanton, Ph.D., Professor at Skidaway Institute of Oceanography, appointed by the Curriculum in Marine Sciences

Anthony Blisklager, Ph.D., Research Assistant Professor of Animal and Equine Medicine at the North Carolina State University College of Veterinary Medicine, appointed by the School of Pharmacy

Steven M. Block, M.B., B.Ch., Associate Professor of Pediatrics at Wake Forest University School of Medicine, appointed by the School of Nursing

John M. Blondin, Ph.D., Associate Professor of Physics at North Carolina State University, appointed by the Department of Physics and Astronomy

Mary T. Boatwright, Ph.D., Professor of Classics at Duke University, appointed by the Department of History

Marie-Helene Bouvier-Colle, Ph.D., Director of Research at INSERM (France) for Perinatal and Women's Health, appointed by the Department of Maternal and Child Health

Paul S. Boyer, Ph.D., Merle Curti Professor of History at the University of Wisconsin at Madison, appointed by the Department of Religious Studies

Douglas C. Boyes, Ph.D., Scientist III at Paradigm Genetics, Inc., appointed by the Department of Biology
John T. Brake, Professor of Poultry Science at North Carolina State University, appointed by the Department of Biomedical Engineering

John Brehm, Ph.D., Associate Professor of Political Science at Duke University, appointed by the Department of Political Science

David G. Bromley, Ph.D., Professor of Sociology and Anthropology at Virginia Commonwealth University, appointed by the Department of Religious Studies

John D. Brown, Ph.D., Assistant Professor of Mathematics at North Carolina State University, appointed by the Department of Physics and Astronomy

Thomas D. Brown, Ph.D., Richard C. Johnston Professor of Biomechanics at the University of Iowa, appointed by the Department of Biomedical Engineering

Leonard S. Bull, Ph.D., Professor of Animal Science, appointed by the Department of Geography

Mary Burdick, Ph.D., Assistant Director of the National Center for Health Promotion and Disease Prevention of the Veterans Health Administration, appointed by the School of Nursing

Anne C. Burke, Ph.D., Assistant Professor of Biology at Wesleyan University, appointed by the Department of Biology

Charles B. Burns, M.S., Research Professor of Radiology at the University of North Carolina at Chapel Hill, appointed by the Department of Environmental Sciences and Engineering

James L. Burrow, Ph.D., Associate Professor and Program Coordinator of Training and Development at North Carolina State University, appointed by the School of Education

Joseph W. Caddell, Ph.D., Associate Professor of History at St. Mary's College, appointed by the School of Journalism and Mass Communication

Gemma Anne Calvert, Ph.D., MRC Research Training Fellow and Head of Multisensory Research Group, University of Oxford, John Radcliffe Hospital, appointed by the Department of Biomedical Engineering

Ruben G. Carbeneil, Ph.D., KOSA Professor and Director of the William R. Kenan Jr. Institute for Engineering, Technology and Science at North Carolina State University, appointed by the Department of Chemistry

Stacia S. Carone, D.Ed., Clinical Education Coordinator, appointed by the Department of Rehabilitation Psychology and Counseling

Jackson W. Carroll, Ph.D., Professor of Religion and Society at The Divinity School at Duke University, appointed by the Department of Religious Studies

Donald K. Cassel, Ph.D., Professor of Soil Science at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering

Carl Cerling, Ph.D., Director of Microbiology Division and Deputy Associate Director for Research at National Center for Toxicological Research, appointed by the Department of Environmental Sciences and Engineering

William H. Chase, Ph.D., Director of Environmental Biology Programs at the National Institute for Environmental Health Science, appointed by the Department of Biology

Nahum D. Chandler, Ph.D., Assistant Professor of English at Duke University, appointed by the Department of Art

Chin-Ho Chen, Ph.D., Research Associate Professor for the Center for AIDS Research at Duke University Medical Center, appointed by the School of Pharmacy

James S. Clark, Ph.D., Associate Professor of Botany at Duke University, appointed by the Department of Biology

Patti H. Claydon, Ph.D., Visiting Lecturer in Division of Multidisciplinary Studies at North Carolina State University, appointed by the Curriculum in Ecology

Elizabeth C. Clipp, Ph.D., Associate Dean for Research at The Geriatric Research Education and Clinical Center of the Durham Veterans Administration Medical Center, appointed by the Department of Health Behavior and Health Education

Mary E. Cogswell, Dr.P.H., M.P.H., Epidemiologist at the National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, appointed by the Department of Nutrition

Robert E. Conrad, Ph.D., Associate Professor of Public Policy and Economics at Duke University, appointed by the Curriculum in Ecology and the Department of Public Policy

Gregory B. Cook, Ph.D., Assistant Professor of Physics at Wake Forest University, appointed by the Department of Physics and Astronomy

Karen S. Cook, Ph.D., James B. Duke Professor of Sociology at Duke University, appointed by the Department of Sociology

Suzanne Cook, Ph.D., Senior Principal Epidemiologist, Worldwide Epidemiology Glaxo Wellcome, Inc., appointed by the Department of Health Policy and Administration

Miriam Cooke, D.Phil., Chair, Asian and African Languages and Literature at Duke University, appointed by the Department of Romance Languages

Miles R. Cooper, M.D., Professor of Medicine at Bowman Gray School of Medicine, appointed by the Department of Health Policy and Administration

Maria T. Correa, Ph.D., Associate Professor of Epidemiology at North Carolina State University College of Veterinary Medicine, appointed by the Department of Environmental Sciences and Engineering

Sheila L. Cory, Ph.D., Director of Technology for the Principals' Executive Program at the University of North Carolina, appointed by the School of Education

Clifton Cox, Ph.D., Chemical Engineer for the Environmental Studies Branch of the National Air and Radiation Environmental Laboratory, appointed by the Department of Environmental Sciences and Engineering

Lee A. Craig, Ph.D., Associate Professor of Economics at North Carolina State University, appointed by the Department of Economics

Gregory S. Crawford, Ph.D., Assistant Professor of Economics at Duke University, appointed by the Department of Economics

Madeleine A. Crockett, Ph.D., Clinical Psychologist at John Umstead Hospital, appointed by the Department of Psychology

Steven M. Crooks, M.S., Industrial Hygienist for Glaxo Wellcome, appointed by the Department of Environmental Sciences and Engineering

Maureen L. Cropper, Ph.D., Professor of Economics at the University of Maryland at College Park, appointed by the Department of Public Policy

Jeffrey J. Crow, Ph.D., Director of Division of Archives and History at North Carolina Department of Cultural Resources, appointed by the Department of History

Larry B. Crowder, Ph.D., Professor of Marine Ecology at Duke University, appointed by the Department of Biology
Zheng Cai, Ph.D., Assistant Professor of Biochemistry at Wake Forest University School of Medicine, appointed by the Department of Nutrition

John D'Eminito, Ph.D., Professor of History at the University of North Carolina at Greensboro, appointed by the Department of History

Leslie H. Damasceno, Ph.D., Assistant Professor of Romance Studies at Duke University, appointed by the Department of Romance Languages

Louis B. Daniel, Ph.D., Marine Fisheries Biologist Supervisor for the North Carolina Division of Marine Fisheries, appointed by the Curriculum in Marine Sciences

Amy D'Aprile, M.A., Lecturer, Skidmore College, Saratoga Springs, NY, appointed by the School of Journalism and Mass Communication

N. Gregson G. Davis, Ph.D., Distinguished Professor of Humanities at Duke University, appointed by the Department of Classics

Alexander J. De Grand, Ph.D., Professor and Chair of History at North Carolina State University, appointed by the Department of Romance Languages

Arturo De Lorenzo, Ph.D., Assistant Professor of Cell Biology at Duke University, appointed by the Department of Biology

Anthony B. DeAngelo, Ph.D., Research Toxicologist at the United States Environmental Protection Agency, appointed by the Department of Environmental Sciences and Engineering

Anthony J. DeCasper, Ph.D., Professor of Psychology at the University of North Carolina at Greensboro, appointed by the School of Nursing

Gerben Dejong, Ph.D., Professor of Family Medicine, appointed by the Department of History

Mariette Deman, Ph.D., Assistant Professor of German at Duke University, appointed by the Department of Germanic Languages

Robert A. Dietrich, Ph.D., Senior Scientist at Novartis Crop Protection, appointed by the Department of Biology

Ronny Bell, Ph.D., Assistant Professor of Public Health Sciences at Wake Forest University, appointed by the School of Nursing

Kenneth A. Dodge, Ph.D., Professor of Public Policy Studies and Psychology at Duke University, appointed by the Department of Psychology

Robert M. Donahoe, Ph.D., Adjunct Associate Professor of Psychiatry at Emory University, appointed by the Curriculum in Neurobiology

John R. Donat, Ph.D., Associate Professor of Chemistry and Biochemistry at Old Dominion University, appointed by the Curriculum in Marine Sciences

Sharyn M. Donfield, Ph.D., Senior Research Scientist at Rho, Incorporated, appointed by the Department of Biostatistics

John W. Drake, Ph.D., Chief of the Laboratory of Molecular Genetics at the National Institute of Environmental Health Sciences, appointed by the Curriculum in Genetics and Molecular Biology

Thomas G. Drake, Ph.D., Assistant Professor of Marine, Earth and Atmospheric Sciences at North Carolina State University, appointed by the Department of Geological Sciences

Kevin L. Dreher, Ph.D., Research Chemist for Health Effects Research Laboratory at United States Environmental Protection Agency, appointed by the Department of Environmental Sciences and Engineering

W.J. Ross Dunscheck, Ph.D., Engineer/Programmer, appointed by the Department of Biomedical Engineering

Jane L. Eckland, Ph.D., Professor of Botany at Duke University, appointed by the Department of Biology

Jack D. Edinger, Ph.D., Associate Clinical Professor of Psychiatry at Duke University, appointed by the Department of Psychology

Eugene J. Eisen, Ph.D., Graduate Administrator of the Department of Animal Science at North Carolina State University, appointed by the Curriculum in Genetics and Molecular Biology

A.D. Eisen, Ph.D., Adjunct Professor of Plant Pathology at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering

Christopher G. Ellison, Ph.D., Associate Professor of Sociology at the University of Texas at Austin, appointed by the Department of Sociology

Robert M. Entman, Ph.D., Professor of Communication at North Carolina State University, appointed by the School of Journalism and Mass Communication

Marina V. Evans, Ph.D., Biomedical Engineer for United States Environmental Protection Agency, appointed by the Department of Environmental Sciences and Engineering

Richard M. Evans, Ph.D., M.R. Pharm., Senior Director of Pharmaceutical Development at Inspire Pharmaceuticals, appointed by the School of Pharmacy

Oleg Favorov, Ph.D., Associate Professor of Electrical Engineering and Computer Science at the University of Central Florida, appointed by the Department of Biomedical Engineering

Peter D. Feaver, Ph.D., Associate Professor of Political Science at Duke University, appointed by the Department of History

Rebecca Helgood Felton, Ph.D., Educational Consultant, appointed by the School of Education

Timothy R. Fennell, Ph.D., Scientist II at the Chemical Industry Institute of Toxicology, appointed by the Department of Environmental Sciences and Engineering

Judith Ferster, Ph.D., Associate Professor of English at North Carolina State University, appointed by the Department of English

Olimpia Figueras, Ph.D., Professor of Mathematical Education, Cinvestav University, appointed by the School of Education

Valeria Finucci, Ph.D., Professor of Italian for the Romance Studies Department at Duke University, appointed by the Department of Romance Languages

Julie Fleury, Ph.D., Associate Professor at Arizona State University, appointed by the School of Nursing

Frank J. Floyd, Ph.D., Associate Professor of Psychology at Georgia State University, appointed by the School of Nursing

Patrick M. Flynn, Ph.D., Senior Research Psychologist at the National Institute on Drug Abuse, appointed by the Department of Health Policy and Administration

Robert Foglesong, Ph.D., Research Scientist at Sphinx Pharmaceuticals, appointed by the School of Pharmacy

S. W. (Peix) Fong, Ph.D., Chief of Nuclear Facilities and Environmental Radiation Survey, appointed by the Department of Environmental Sciences and Engineering

Susan A. Fereman, Ph.D., A.T.C., P.T., Clinical Instructor, Department of Orthopaedics Surgery at the University of Virginia, appointed by the Department of Exercise and Sport Science

Joshua B. Forrest, Ph.D., Associate Professor of Political Science at the University of Vermont, appointed by the Department of Political Science

Robert D. Foss, Ph.D., Manager of Alcohol Studies at the University of North Carolina Highway Safety Research Center, appointed by the Department of Sociology
Craig R. Fox, Ph.D., Assistant Professor of Management at Duke University, appointed by the Department of Psychology
Edward C. Franklin, Ph.D., Professor of Forestry at North Carolina State University, appointed by the Curriculum in Ecology
John D. French, Ph.D., Associate Professor of Latin American History at Duke University, appointed by the Department of Political Science
Edward H. Friedman, Ph.D., Professor of Spanish and Portuguese at the University of Indiana, appointed by the Department of Romance Languages
Sally Friedman, Ph.D., Associate Professor of Political Science at State University of New York at Albany, appointed by the Department of Political Science
Eileen D. Fried, Ph.D., Executive Officer for the Division of Astronomical Sciences at the National Science Foundation, appointed by the Department of Physics and Astronomy
James C. Garbutt, M.D., Associate Professor of Psychiatry, appointed by the Curriculum in Neurobiology
Sarah Young Gardner, D.V.M., Ph.D., Assistant Professor of Equine Medicine at North Carolina State University College of Veterinary Medicine, appointed by the School of Pharmacy
James W. Garrison, Ph.D., Professor of Teaching and Learning at the College of Human Resources and Education, appointed by the School of Education
Gary Gereffi, Ph.D., Professor of Sociology at Duke University, appointed by the Department of Political Science
Paula Giddings, B.A., Research Professor of Women's Studies at Duke University, appointed by the Department of Political Science
Francis Giesbrecht, Ph.D., Professor of Statistics at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering
Gorman Gilbert, Ph.D., Head, School of Civil and Environmental Engineering at Oklahoma State University, appointed by the Department of Political Science
James Gilliam, Ph.D., Professor of Zoology at North Carolina State University, appointed by the Curriculum in Ecology
Peggi C. Giordano, Ph.D., Professor of Sociology at Bowling Green State University, appointed by the Department of Psychology
Geert-Joachim Glabner, Ph.D., Professor for German Politics at Humboldt University Berlin, appointed by the Department of Political Science
Henk E. Goemans, Ph.D., Assistant Professor of Political Science at Duke University, appointed by the Department of Political Science
Pamela L. Golden, Ph.D., Senior Research Scientist at DuPont Pharmaceuticals Company, appointed by the School of Pharmacy
Ricky F. Goldstein, M.D., Assistant Clinical Professor of Pediatrics at Duke University Medical Center, appointed by the School of Education
Roger V. Gould, Ph.D., Assistant to Associate Professor of Sociology at the University of Chicago, appointed by the Department of Sociology
Bruce Grant, Ph.D., Assistant Professor of Anthropology at Swarthmore College, appointed by the Curriculum in Ecology
Walter M. Grayman, Ph.D., Independent Consulting Engineer, Cincinnati, Ohio, appointed by the Department of Environmental Sciences and Engineering
Larry J. Griffin, Ph.D., Professor of Sociology at Vanderbilt University, appointed by the Department of Sociology
Bradley C. Grimes, M.S., Corporate Health and Safety Services at Amoco Corporation, appointed by the Department of Environmental Sciences and Engineering
Jim Gribby, Ph.D., Associate Professor, Department of Medicine at University of Colorado, appointed by the School of Nursing
Grant T. Gulledge, Ph.D., Professor of Radiology at the University of Utah, appointed by the Department of Biomedical Engineering
Suzanne A. Gulledge, Ph.D., Clinical Associate Professor of Education
David G. Haase, Ph.D., Director of the Science House at North Carolina State University, appointed by the School of Education
Miwako Hagiwara, Ph.D., Senior Consultant, Policy Analysis Incorporated, appointed by the Department of Economics
Benjamin D. Hall, Ph.D., Professor of Botany at the University of Washington, appointed by the Department of Biology
Fred D. Hall, Ph.D., Associate Professor of Urban and Social Studies at Saint Augustine's College, appointed by the Department of Sociology
James A. Hall, Ph.D., Associate Professor of Social Work at the University of Iowa, appointed by the Department of Maternal and Child Health
Peter Hamilton, Ph.D., Senior Scientist at SAIC, appointed by the Curriculum in Marine Sciences
Sarah Hamn-Alvarez, Ph.D., Associate Professor of Pharmaceutical Sciences at the University of Southern California, appointed by the School of Pharmacy
Michael Hardi, Ph.D., Associate Professor of Literature and Italian at Duke University, appointed by the Department of Communication Studies
William C. Harrison, Ed.D., Superintendent of Cumberland County Schools, appointed by the School of Education
John A. Hattie, Ph.D., Professor and Chair of Educational Research Methodology at The University of North Carolina at Greensboro, appointed by the School of Education
Deborah D. Hatton, Ph.D., Investigator and Director of Carolina Fragile X Project at Frank Porter Graham Child Development Center, appointed by the School of Education
David C. Hauri, Ph.D., M.P.A., Dreyfus Postdoctoral Fellow at the Carolina Environmental Program at The University of North Carolina at Chapel Hill, appointed by the Department of Environmental Sciences and Engineering
Mark E. Hay, Ph.D., Teasby Professor of Environmental Biology at Georgia Institute of Technology, appointed by the Department of Biology
John E. Haynes, Ph.D., Manuscript Historian for the Library of Congress, appointed by the Department of History
Joseph Heitman, M.D., Ph.D., Assistant Professor of Genetics and Pharmacology at Duke University, appointed by the Department of Biology
Timothy J. Henderson, Ph.D., Assistant Professor of History at Auburn University at Montgomery, appointed by the Department of History
Miguel A. Herve, Ph.D., Senior Associate, Charles River Associates, Boston, Massachusetts, appointed by the Department of Economics
David Herman, Ph.D., Professor of English at North Carolina State University, appointed by the Department of Linguistics
Cynthia B. Herrup, Ph.D., Professor of History and Law at Duke University, appointed by the Department of Art
Cynthia B. Herrup, Ph.D., Professor of History and Law at Duke University, appointed by the Department of History
Anne E. Hershey, Ph.D., Professor of Biology at the University of Minnesota at Duluth, appointed by the Department of Environmental Sciences and Engineering

Michael S. Hershfield, M.D., Professor of Medicine at Duke University Medical Center, appointed by the Department of Pharmacology

Nancy A. Hewitt, Ph.D., Professor of History and Women's Studies at Rutgers University, appointed by the Department of Political Science

Melvyn P. Heyes, Ph.D., Senior Staff Scientist at the National Institutes of Mental Health, appointed by the Curriculum in Neurobiology

Barbara Heyns, Ph.D., Professor of Sociology at New York University, appointed by the Department of Sociology

James P. Hibbard, Ph.D., Associate Professor of Marine, Earth and Atmospheric Sciences at North Carolina State University, appointed by the Department of Geological Sciences

James E. Higgins, Ph.D., Executive Vice President and Director of Health Decisions, Inc., appointed by the Department of Biostatistics

Hans J. Hillebrand, Ph.D., L.L.D., Professor of Religion at Duke University, appointed by the Department of Religious Studies

Albert C. Hine III, Ph.D., Professor of Marine Science at the University of South Florida, appointed by the Department of Geological Sciences

Christopher J. Hirsch, M.S., Physical Therapist and Athletic Trainer, appointed by the Department of Exercise and Sport Science

Peter C. Holland, Ph.D., James B. Duke Professor of Psychology at Duke University, appointed by the Department of Psychology

Frederick Human, Ph.D., Senior Research Associate for Service Delivery Research, Family Health International, appointed by the Department of Health Policy and Administration

Kathryn E. Hood, Ph.D., Associate Professor of Human Development at Pennsylvania State University, appointed by the Department of Psychology

Michael Hoover, Ph.D., Professor of Soil Science at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering

Frank M. Howell, Ph.D., Professor of Sociology at Mississippi State University, appointed by the Department of Environmental Sciences and Engineering

Jolyon Howorth, Ph.D., Professor of European Studies and Modern Languages at the University of Bath, England, appointed by the Department of Political Science

Dionysios T. Hristopoulos, Ph.D., Paper and Pulp Research Institute of Canada, appointed by the Department of Environmental Sciences and Engineering

Carol Hubbard, M.S.N., Clinical Instructor, UNC-Chapel Hill School of Medicine, appointed by the School of Nursing

Michael L. Hubbard, Ph.D., Research Statistician and Psychologist at Research Triangle Institute, appointed by the Department of Maternal and Child Health

Michael F. Hughes, Ph.D., Toxicologist for the United States Environmental Protection Agency, appointed by the Department of Environmental Sciences and Engineering

Frank J. Humenik, Ph.D., Professor and Department Head of Biological and Agricultural Engineering at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering

Michael A. Huston, Ph.D., Senior Scientist for the Environmental Science Division of the Oak Ridge National Laboratory, appointed by the Department of Biology

Robert A. Izdore, Ph.D., Professor of Chemistry at North Carolina Central University, appointed by the School of Pharmacy

Walter A. Jackson, Ph.D., Associate Professor of History at North Carolina State University, appointed by the School of Journalism and Mass Communication

Michael F. Jacobson, Ph.D., Executive Director, Center for Science in the Public Interest, appointed by the Department of Health Policy and Administration

Fredric R. Jameson, Ph.D., Professor of Literature at Duke University, appointed by the Department of Romance Languages

Ronald S. Jarmin, Ph.D., Economist for the Center for Economic Studies at the United States Bureau of the Census, appointed by the Department of Economics

Sandra Jarz, M.S.N., Director of Critical Care Services for UNC Hospitals, appointed by the School of Nursing

Ronald Jaschuck, Ph.D., Professor of Biomedical Engineering at Duke University Medical Center, appointed by the Department of Biomedical Engineering

Lee Ann Jaykus, Ph.D., Assistant Professor of Food Science at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering

Emmanuel Jimenez, Ph.D., Sector Director, Education, South Asia Region, for The World Bank, appointed by the Department of City and Regional Planning

Christopher M. S. Johns, Ph.D., Associate Professor of Art at the University of Virginia at Charlottesville, appointed by the Department of Art

Ronald W. Johnson, Ph.D., Vice President of Social Sciences and International Development for Research Triangle Institute, appointed by the Department of Public Policy

Daniel Johnston, Ph.D., Professor of Neuroscience at Baylor College of Medicine, appointed by the Curriculum in Neurobiology

William J. Johnston, Ph.D., Professor and Chair of Specialty Studies in Education at the University of North Carolina at Wilmington, appointed by the School of Education

Byron C. Jones, Ph.D., Professor of Biobehavioral Health and Pharmacology at Pennsylvania State University, appointed by the Department of Psychology

Gilbert M. Joseph, Ph.D., Professor of History at Yale University, appointed by the Department of History

Kathleen M. Joyce, Ph.D., Assistant Professor of Religion at Duke University, appointed by the Department of Religious Studies

Spero G. Karas, Ph.D., Assistant Professor, Department of Orthopaedics, UNC-Chapel Hill, appointed by the Department of Exercise and Sport Science

Hasan Karimi, Ph.D., Adjunct Assistant Professor of Forestry at GIS and Remote Sensing Center at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering

Brian Kay, Ph.D., Professor of Pharmacy at the University of Wisconsin, appointed by the Department of Biology

Wendy E. Kaye, Ph.D., Chief of the Epidemiology and Surveillance Branch at the Agency for Toxic Substances and Disease Registry, appointed by the Department of Environmental Sciences and Engineering

William R. Keefe, Ph.D., Professor of Political Economy at Carnegie Mellon University, appointed by the Department of Political Science

Francis Keefe, Ph.D., Professor Department of Psychiatry and Behavioral Sciences at Duke University, appointed by the School of Nursing
Susan Ann Keefe, Ph.D., Associate Professor of Divinity at Duke University, appointed by the Department of History
Carl T. (Tim) Kelley, Ph.D., Professor of Mathematics at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering
Robert L. Kelly, Ph.D., Professor of Anthropology at the University of Wyoming, appointed by the Department of Anthropology
Terrence P. Kenakin, Ph.D., Research Scientist, appointed by the Department of Neurology
Robert O. Kekoski, Ph.D., James B. Duke Professor of Political Science at Duke University, appointed by the Department of Political Science
Robert Kieper, Ph.D., Associate Professor of Chemistry at The University of North Carolina at Wilmington, appointed by the Curriculum in Marine Sciences
Chong S. Kim, Ph.D., Senior Research Scientist, Human Studies Division, National Health and Environmental Effects Research Laboratory, U.S. Environmental Protection Agency, appointed by the Department of Environmental Sciences and Engineering
Michael A. King, Ph.D., Professor of Radiology at the University of Massachusetts Medical School, appointed by the Department of Biomedical Engineering
Douglas J. Kiselow, Ph.D., Director of Polymer Chemistry for United States Army Research Office, appointed by the Department of Chemistry
Herbert Krischelt, Ph.D., Professor, appointed by the Department of Political Science
Katherine W. Klein, Ph.D., Associate Professor of Psychology at North Carolina State University, appointed by the School of Nursing
Tadeusz E. Kleinidt, Ph.D., Principal Scientist at Manta International Environmental Technology, Inc., appointed by the Department of Environmental Sciences and Engineering
Gary R. Klinefelter, Ph.D., Research Biologist for the Developmental Toxicology Division of the Environmental Protection Agency, appointed by the Curriculum in Toxicology
Vernon J. Knight, Ph.D., Professor of Anthropology at the University of Alabama, appointed by the Department of Anthropology
Robert P. Kelker, Ph.D., Professor of English at the University of Maryland at College Park, appointed by the Department of English
David Allen Koppenhaver, Ph.D., Associate Clinical Professor and Director of Center for Literacy and Disability Studies at Duke University, appointed by the School of Education
Robert R. Korstad, Ph.D., Assistant Professor of Public Policy at Duke University, appointed by the Department of History
Randall A. Kramer, Ph.D., Professor of Economics at Duke University, appointed by the Department of Public Policy
Kathleen A. Kron, Ph.D., Assistant Professor of Biology at Wake Forest University, appointed by the Department of Biology
Thomas A. Kunkel, Ph.D., Director of Environmental Biology Program at the National Institute of Environmental Health Sciences, appointed by the Department of Biology
Ronald M. Lathem, Ph.D., Research Investigator in International Science Development Group at Glaxo Wellcome, appointed by the School of Pharmacy
Thomas Latusen, Ph.D., Associate Professor of Slavic Languages and Literatures at Duke University, appointed by the Department of History
Vickie L. Lamb, Ph.D., Assistant Professor of Sociology at the University of South Carolina, appointed by the Department of Sociology
Millard H. Lambert, Ph.D., Research Investigator II at Glaxo Wellcome, appointed by the School of Pharmacy
Michael K. Lamvik, Ph.D., Technical Staff Member at MCNC, appointed by the Department of Physics and Astronomy
Kenneth C. Land, Ph.D., John Franklin Crowell Professor, appointed by the Department of Sociology
Helen S. Lang, Ph.D., Associate Professor of Art History at American University, appointed by the Department of Art
Peter Lange, Ph.D., Professor of Political Science at Duke University, appointed by the Department of Political Science
John M. Lannon Jr., Ph.D., Analytical and Fabrication Laboratory Group Leader for MCNC, Research Triangle Park, appointed by the Department of Physics and Astronomy
Tad A. Laurson, Ph.D., Assistant Professor of Civil Engineering at Duke University, appointed by the Department of Environmental Sciences and Engineering
Richard D. Law, Ph.D., Associate Professor of Geological Sciences at Virginia Polytechnic Institute and State University, appointed by the Department of Geological Sciences
Gregory F. Lawler, Ph.D., Professor of Mathematics at Duke University, appointed by the Department of Statistics
Martin E. Lebo, Ph.D., Research Scientist for Weyerhaeuser Company, appointed by the Department of Environmental Sciences and Engineering
C. Virginia Lee, M.D., M.P.H., Medical Officer for Division of Health Assessment and Consultation at Agency for Toxic Substances and Disease Registry, appointed by the Department of Environmental Sciences and Engineering
David S. Lee, M.S., Curator of Birds at North Carolina State Museum of Natural Science, appointed by the Department of Biology
Robert J. Leffkowitz, M.D., Professor of Biochemistry at Duke University, appointed by the Department of Biology
Elana L. Leithold, Ph.D., Associate Professor of Marine, Earth and Atmospheric Sciences at North Carolina State University, appointed by the Department of Geological Sciences
Daniel J. Lew, Ph.D., Assistant Professor of Pharmacology at Duke University, appointed by the Department of Biology
Nan Lin, Ph.D., Professor of Sociology at Duke University, appointed by the Department of Sociology
Karl G. Linden, Ph.D., Assistant Professor of Civil and Environmental Engineering at Duke University, appointed by the Department of Environmental Sciences and Engineering
Michael Linhares, Ph.D., Project Leader, Cardiovascular Metabolic Disease Discovery at Pfizer Incorporated, appointed by the School of Pharmacy
Richard Lischer, Ph.D., Professor of Religion at Duke Divinity School, appointed by the Department of Religious Studies
Brett Litz, Ph.D., Associate Professor of Behavioral Science at Boston University, appointed by the Department of Psychology
Jie Liu, Ph.D., Assistant Professor of Chemistry at Duke University, appointed by the Department of Physics and Astronomy
David F. Lobach, M.D., Ph.D., Assistant Research Professor of Biomedical Engineering at Duke University, appointed by the Department of Biomedical Engineering
Charles H. Long, Ph.D., Emeritus Professor of Religion at the University of California at Santa Barbara, appointed by the Department of History
R. Gregory Lough, Ph.D., Supervisory Research Oceanographer for the Northeast Fisheries Science Center at Woods Hole, appointed by the Curriculum in Marine Sciences

W. George Lovell, Ph.D., Professor of Geography at Queen's University, Canada, appointed by the Department of Geography

Brian E. Louman, Ph.D., Professor of Political Science at San Diego State University, appointed by the Department of Political Science

Bobbie B. Lubker, Ph.D., Clinical Professor of Education

Alexander R. Lussow, Ph.D., Director of Business Development for SangStat Medical Corporation, appointed by the School of Pharmacy

Edmond F. Maes, Ph.D., Associate Director for Science for the Data Management Division of the National Immunization Program of the Centers for Disease Control, appointed by the Department of Health Policy and Administration

Robert J. Magnani, Ph.D., Associate Professor of Public Health and Tropical Medicine at Tulane University, appointed by the Department of Health Behavior and Health Education

Peter E. Malin, Ph.D., Associate Professor of Geology at Duke University, appointed by the Department of Geological Sciences

Paul S. Manos, Ph.D., Assistant Professor of Botany at Duke University, appointed by the Department of Biology

Ted B. Martonen, Ph.D., Senior Research Scientist, Experimental Toxicology Division, United States Environmental Protection Agency, appointed by the Department of Environmental Sciences and Engineering

Elizabeth S. Matson, M.A., Exercise Specialist, Orange Cardiovascular Foundation, appointed by the Department of Exercise and Sport Science

James M. Matthews, Ph.D., Senior Research Biochemical Toxicologist at Triangle Research Institute, appointed by the School of Pharmacy

Frederick W. Mayer, Ph.D., Associate Professor of Public Policy at Duke University, appointed by the Department of Political Science

Karl U. Mayer, Dr. Res. Soc., Director, Max-Planck Institute for Human Development, Germany, appointed by the Department of Sociology

Michael W. Mayfield, Ph.D., Professor and Chair of Geography and Planning at Appalachian State University, appointed by the Department of Geography

Sally D. Mays, M.A., Head Athletic Trainer at Fetzer Gymnasium, appointed by the Department of Exercise and Sport Science

David R. McClay Jr., Ph.D., Professor of Zoology, Immunology, and Neurobiology at Duke University, appointed by the Department of Biochemistry and Biophysics

Ellie McConnell, Ph.D., Assistant Research Professor at Duke University School of Nursing, appointed by the School of Nursing

Thomas J. McCown, Ph.D., Research Associate Professor of Psychiatry at the University of North Carolina at Chapel Hill, appointed by the Curriculum in Neurobiology

Thad L. McDonald, M.D., Clinical Assistant Professor or Obstetrics and Gynecology at Wake Area Health Education Center, Wake Medical Center, appointed by the Department of Nutrition

Mary C. McCallan, Ph.D., Research Professor of Pharmacology at North Carolina State University College of Veterinary Medicine, appointed by the Department of Pharmacology

Stephen J. McGregor, Ph.D., Associate Director, Spatial Analysis, Carolina Population Center, appointed by the Department of Environmental Sciences and Engineering

Peter McSlaic, Ph.D., Assistant Professor of German at Duke University, appointed by the Department of Germanic Languages

H. James McLaughlin, Ph.D., Assistant Professor of Education at the University of Georgia, appointed by the School of Education

Leonard McMillan, Ph.D., Assistant Professor at the Massachusetts Institute of Technology, appointed by the Department of Computer Science

Jesse E. McNinch, Ph.D., Natural Resources Council Postdoctoral Scholar at Waterways Experiment Station, Kitty Hawk, North Carolina, appointed by the Curriculum in Marine Sciences

Louise McReynolds, Ph.D., Assistant Professor of History at the University of Hawaii, appointed by the Department of History

Wilson C. McWilliams, Ph.D., Professor of Political Science at Rutgers University, appointed by the Department of Political Science

Bruce M. Menchetti, Ph.D., Associate Professor of Special Education at Florida State University, appointed by the School of Education

Alfred H. Merrill Jr., Ph.D., Professor of Biochemistry at Emory University School of Medicine, appointed by the Department of Nutrition

Stephen S. Mick, Ph.D., Professor of Health Management and Policy at the University of Michigan, appointed by the Department of Geography

Roslyn A. Mickelson, Ph.D., Assistant Professor of Sociology, Anthropology, and Social Work at the University of North Carolina at Charlotte, appointed by the Department of Sociology

Ellen Mickiewicz, Ph.D., Professor of Public Policy at Duke University, appointed by the Department of History

Martin A. Miller, Ph.D., Professor of History at Duke University, appointed by the Department of History

Ronald C. Miller, Coach/Adjunct Instructor, Athletics, UNC-Chapel Hill, appointed by the Department of Exercise and Sport Science

Thomas J. Miller, Ph.D., Assistant Professor of Environmental Science at the University of Maryland, appointed by the Curriculum in Marine Sciences

Nancy Mitchell, Ph.D., Assistant Professor of History at North Carolina State University, appointed by the Department of History

Eric Mlyn, Ph.D., Assistant Director of the Center for Undergraduate Excellence at The University of North Carolina at Chapel Hill, appointed by the Department of History

David C. Montefiori, Ph.D., Associate Research Professor of Experimental Surgery at Duke University, appointed by the Curriculum in Genetics and Molecular Biology

James M. Moore Jr., Ph.D., Senior Psychologist at Broughton Hospital, appointed by the Department of Psychology

Roberta A. Morales, Ph.D., Assistant Professor of Epidemiology at Virginia-Maryland Regional College of Veterinary Medicine, appointed by the Department of Environmental Sciences and Engineering

Alberto Moreiras, Ph.D., Associate Professor of Romance Studies at Duke University, appointed by the Department of Romance Languages

S. Philip Morgan, Ph.D., Professor of Sociology at Duke University, appointed by the Department of Sociology

Scott Morgenstern, Ph.D., Assistant Professor of Political Science at Duke University, appointed by the Department of Political Science

David R. Morrison, Ph.D., Professor of Mathematics and Physics at Duke University, appointed by the Department of Physics and Astronomy

Patrick J. Moyer, Ph.D., Assistant Professor of Physics at the University of North Carolina at Charlotte, appointed by the Department of Physics and Astronomy
Constance E. Mullinix, Ph.D., Senior Fellow for the Southern Growth Policy Board, appointed by the Department of Health Policy and Administration
Judy L. Mumford, Ph.D., Research Health Scientist for National Health and Environmental Effects Research Laboratory for the United States Environmental Protection Agency, appointed by the Department of Environmental Sciences and Engineering
Michael C. Munger, Ph.D., Chair, Department of Political Science, Duke University, appointed by the Department of Public Policy
Lisa S. Murr, M.S., Lead School Psychologist for Chapel Hill-Carrboro City Schools, appointed by the School of Education
H. Troy Nagle Jr., Ph.D., Professor of Electrical and Computer Engineering at North Carolina State University, appointed by the Department of Biomedical Engineering
Michael G. Narotsky, Ph.D., Toxicologist at the Reproductive Toxicology Division of the United States Environmental Protection Agency, appointed by the Department of Environmental Sciences and Engineering
Elizabeth J. Natalle, Ph.D., Associate Professor of Communication Studies at the University of North Carolina at Greensboro, appointed by the School of Nursing
Krishna S. Nathan, Ph.D., Senior Manager, IBM T.J. Watson Research Center, appointed by the Department of Computer Science
Bruce Nicklaus, Ph.D., Professor of Cell Biology and Zoology at Duke University, appointed by the Department of Biology
Miguel A. T. Nicolelis, M.D., Ph.D., Associate Professor of Neurobiology at Duke University Medical Center, appointed by the Curriculum in Neurobiology
H. Frederik Nijhout, Ph.D., Professor of Zoology at Duke University, appointed by the Department of Biology
Gabriela Nouzelles, Ph.D., M.A., Assistant Professor of Romance Studies at Duke University, appointed by the Department of Romance Languages
Stephen Nowicki, Ph.D., Associate Professor of Zoology at Duke University, appointed by the Department of Biology
Thomas M. O’Connell, Ph.D., Research Investigator I at GlaxoWellcome Inc., appointed by the School of Pharmacy
Karen J. O’Donnell, Ph.D., Assistant Professor of Psychiatry at Duke University, appointed by the Department of Psychology
Linda Oldham, Ph.D., Social Anthropologist, appointed by the Department of Anthropology
James A. Onate, M.A., Doctoral Student in Human Movement Science, appointed by the Department of Exercise and Sport Science
Paul E. Orndorff, Ph.D., Professor of Microbiology at North Carolina State University College of Veterinary Medicine, appointed by the Department of Microbiology and Immunology
David L. Pateo, Ph.D., Professor of Political Science at Duke University, appointed by the School of Journalism and Mass Communication
Edith A. Parker, Dr.P.H., Assistant Professor at the University of Michigan School of Public Health, appointed by the Department of Health Behavior and Health Education
David L. Parker, Associate Professor of Medicine at Duke University, appointed by the Curriculum in Genetics and Molecular Biology
Keith L. Parker, M.D., Ph.D., Associate Professor of Medicine at Duke University, appointed by the Curriculum in Genetics and Molecular Biology
S. Thomas Parker, Ph.D., Professor of History at North Carolina State University, appointed by the Department of Classics
John S. Parks, Ph.D., Professor of Pathology at Wake Forest University School of Medicine, appointed by the Curriculum in Genetics and Molecular Biology
Enilio A. Parrado, Ph.D., Assistant Professor of Sociology at Duke University, appointed by the Department of Sociology
Gregory N. Parsons, Ph.D., Associate Professor of Chemistry at North Carolina State University, appointed by the Department of Physics and Astronomy
Joseph R. Pawlik, Ph.D., Associate Professor of Biology at the University of North Carolina at Wilmington, appointed by the Curriculum in Marine Sciences
Charles M. Payne, Ph.D., Professor of African and African American Studies and History at Duke University, appointed by the Department of History
Terry Frank Peachell, Ph.D., Visiting Scientist, Office on Smoking and Health, Centers for Disease Control and Prevention, appointed by the Department of Health Policy and Administration
Ann M. Penrose, Ph.D., Associate Professor of English at North Carolina State University, appointed by the Department of English
Lance E. Perryman, D.V.M., Ph.D., Professor and Head of Microbiology, Pathology and Parasitology at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering
Catherine Peyroux, Ph.D., Assistant Professor of History at Duke University, appointed by the Department of History
Thomas Pfau, Ph.D., Associate Professor of English at Duke University, appointed by the Department of Germanic Languages
Kimberly C. Phillips, Ph.D., Research Associate in Epidemiology at Wake Forest University School of Medicine, appointed by the School of Nursing
Torn R. Phillips, D.V.M., Ph.D., Assistant Member of Department of Neuropharmacology at the Scripps Research Institute, appointed by the Curriculum in Neurobiology
James L. Pinkney, Ph.D., Assistant Professor of Oceanography at Texas A&M University, appointed by the Curriculum in Marine Sciences
Joachim D. Pfieß, M.R.S., Research Physical Scientist for National Exposure Research Lab at United States Environmental Protection Agency, appointed by the Department of Environmental Sciences and Engineering
M. Renen Plessner, Ph.D., Assistant Professor of Physics at Duke University, appointed by the Department of Physics and Astronomy
Joseph W. Polli, Ph.D., Research Investigator at Glaxo Wellcome, appointed by the School of Pharmacy
Richard A. Posner, L.L.B., Circuit Judge, United States Court of Appeals for the Seventh Circuit and Senior Lecturer at the University of Chicago Law School, appointed by the Department of Economics
Carl J. Posy, Ph.D., Professor of Philosophy at Hebrew the University of Jerusalem, Israel, appointed by the Department of Philosophy
Barbara D. Powe, Ph.D., Associate Professor of Nursing at the University of South Carolina, appointed by the School of Nursing
Richard J. Powell, Ph.D., Professor and Chair of Department of Art and Art History at Duke University, appointed by the Department of Art
Lincoln F. Pratson, Ph.D., Assistant Professor of Earth and Ocean Sciences at Duke University, appointed by the Department of Geological Sciences

Phillip J. Prete, M.S.P.H., Head of Field Operations Branch of Solid Waste Section at North Carolina Department of Environment Health and Natural Resources, appointed by the Department of Environmental Sciences and Engineering

Charles Price, Ph.D., Research Associate Professor at UNC-Chapel Hill, appointed by the Department of Anthropology

John B. Pritchard, Ph.D., Supervisory Research Physiologist and Chief of Laboratory of Pharmacology and Chemistry at the National Institutes of Health, appointed by the School of Pharmacy

Jama L. Purser, M.S., Research Associate in Physical and Occupational Therapy at Duke University Medical Center, appointed by the Division of Physical Therapy

Janice A. Radway, Ph.D., Frances Hill Fox Professor in Humanities at Duke University, appointed by the School of Journalism and Mass Communication

S. Ranji Ranjithan, Ph.D., Associate Professor of Civil Engineering at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering

Randolph Rasch, Ph.D., Clinical Associate Professor at Vanderbilt, appointed by the School of Nursing

Mark D. Raucher, Ph.D., Professor of Zoology at Duke University, appointed by the Department of Biology

James H Rayner, Ph.D., Research Analytical Chemist, appointed by the Department of Environmental Sciences and Engineering

Elizabeth Gray Raymond, M.D., Associate Medical Director of the Biomedical Affairs Division of Family Health International, appointed by the Department of Biostatistics

Kenneth Reckhow, Ph.D., Director of the Water Resources Research Institute of the University of North Carolina, appointed by the Department of Environmental Sciences and Engineering

William M. Reddy, Ph.D., William T. Laprade Professor of History at Duke University, appointed by the Department of History

John E. Reinhart, Ph.D., Senior Research Investigator for Glaxo Wellcome, appointed by the Curriculum in Neurobiology

Peter H. Reinhart, Ph.D., Assistant Professor of Neurobiology at Duke University School of Medicine, appointed by the Curriculum in Neurobiology

Mitchell A. Renslow, Ph.D., Assistant Professor of Agricultural and Resource Economics at North Carolina State University, appointed by the Department of Anthropology

Michael A. Resnick, Ph.D., Geneticist and Head, Chromosome Stability Group for the National Environmental Institute for Environmental Health Sciences, appointed by the Curriculum in Genetics and Molecular Biology

Louise Rice, Ph.D., Professor of Art at Duke University, appointed by the Department of Art

Russell E. Richey, Ph.D., Professor of Church History at Duke University, appointed by the Department of History

Kent J. Rigby, M.A., Professor of Epigraphy and Ancient History at Duke University, appointed by the Department of History

Andrew J. Rindos III, Ph.D., Senior Engineer at IBM Corporation, appointed by the Department of Operations Research

Deborah Ann Roach, Ph.D., Research Assistant Professor of Zoology at Duke University, appointed by the Department of Biology

Kenneth M. Roberts, Ph.D., Assistant Professor of Political Science at the University of New Mexico, appointed by the Department of Political Science

Sherman Robinson, Ph.D., Division Director, International Food Policy Research Institute (IFPRI), Trade and Macroeconomics Division, appointed by the Department of Public Policy

Howard A. Rockman, M.D., Associate Professor of Medicine at Duke University, appointed by the Curriculum in Genetics and Molecular Biology

Lance E. Rodewald, M.S., M.D., Associate Director for Science, Immunization Services Division of the Centers for Disease Control, appointed by the Department of Health Policy and Administration

Alex Roland, Ph.D., Professor of History at Duke University, appointed by the Department of Political Science

James L. Rolleston, Ph.D., Professor and Chair of German at Duke University, appointed by the Department of Germanic Languages

Carol A. Romano, Ph.D., Chief of Clinical Informatics Services at National Institutes of Health Clinical Center, appointed by the School of Nursing

Bert S. Rosenberg, M.D., Ed.D., Physician at Chapel Hill Internal Medicine, appointed by the School of Nursing

Scott E. Ross, M.A., Doctoral Student in Exercise and Sport Science at the University of North Carolina at Chapel Hill, appointed by the Department of Exercise and Sport Science

Kenneth W. Rundell, Adjunct Associate Professor, United States Olympic Center, appointed by the Department of Exercise and Sport Science

Andrew Rusinok III, Ph.D., Project Manager for Research Information Resources at Glaxo Wellcome, appointed by the School of Pharmacy

José Sandwell, M.S., Programmer Analyst at Carolina Population Center, appointed by the Department of Political Science

Martinus Roeland M. Schaefer, Ph.D., Visiting Scientist/Principal Investigator, Laboratory of Molecular Genetics, National Institute of Environmental Health Sciences, appointed by the Department of Environmental Sciences and Engineering

Stanley Schainker, Ed.D., Clinical Associate Professor of Education

Laura E. Schanberg, M.D., Assistant Professor of Pediatric Rheumatology at Duke University, appointed by the Department of Psychology

Anne L. Schiller, Ph.D., Associate Professor of Anthropology at North Carolina State University, appointed by the Department of Geography

Joyce K. Schiller, Ph.D., Curator of Reynolds House Museum of American Art, appointed by the Department of Art

William H. Schlesinger, Ph.D., James B. Duke Professor of Botany at Duke University, appointed by the Department of Environmental Sciences and Engineering

Paul M. Schlosser, Ph.D., Scientist I, Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina, appointed by the Curriculum in Toxicology

Tad M. Schmalz, Ph.D., Associate Professor of Philosophy at Duke University, appointed by the Department of Philosophy

Robert A. Schneider, M.S., Physical Therapist and Athletic Trainer, appointed by the Department of Exercise and Sport Science

Sarah Schroth, Ph.D., Adjunct Associate Professor of Art at Duke University, appointed by the Department of Art

Michael L. Schwalbe, Ph.D., Associate Professor of Sociology at North Carolina State University, appointed by the Department of Sociology
William A. Searcy, Ph.D., Professor and Chair of Biology at the University of Miami, appointed by the Department of Biology

Richard B. Searles, Ph.D., Professor of Botany at Duke University, appointed by the Department of Biology

Richard Sennett, Ph.D., Professor of History and Sociology at New York University, appointed by the Department of Sociology

Cosette Serabjit-Singh, Ph.D., Director, U.S. BioMet Science Development Group of GlaxoWellcome, appointed by the School of Pharmacy

Matt Serra, Ph.D., Assistant Professor of Psychology at Duke University, appointed by the Department of Psychology

Andrea J. Shapiro, Ph.D., Systemic Learning Catalyst at Nortel Networks, appointed by the Department of Psychology

Mary Alice Shaver, Ph.D., Professor and Chair, Department of Advertising, Michigan State University, appointed by the School of Journalism and Mass Communication

John D. Shelburne, M.D., Ph.D., Professor of Pathology at Duke University, appointed by the Curriculum in Toxicology

Barbara Sherry, Ph.D., Associate Professor of Microbiology, Pathology, and Parasitology at North Carolina State University, appointed by the Department of Microbiology and Immunology

Y.S. Carol Shieh, Ph.D., Food and Drug Administration Gulf Coast Seafood Lab in Alabama, appointed by the Department of Environmental Sciences and Engineering

William J. Shillers, Ph.D., Associate Professor of Marine, Earth, and Atmospheric Sciences at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering

Stephanie Siebert, Ph.D., Associate Professor of Romance Studies at Duke University, appointed by the Department of Romance Languages

Irene Silverblatt, Ph.D., Associate Professor of Cultural Anthropology at Duke University, appointed by the Department of History

Paul H. Sisco, Ph.D., USDA Research Geneticist from North Carolina State University, appointed by the Department of Biology

Jesse P. Skene, Ph.D., Associate Professor of Neurobiology at Duke University Medical Center, appointed by the Curriculum in Neurobiology

Rebecca T. Stifflin, Ph.D., Director, Program on Health Care Economics and Finance at Sheps Center for Health Services Research, appointed by the Department of Maternal and Child Health

Frank A. Sloan, Ph.D., Professor of Health Policy and Economics at Duke University, appointed by the Department of Economics

Barbara H. Smith, Ph.D., Braxton Craven Professor of Literature and English at Duke University, appointed by the Department of Anthropology

Kenneth L. Smith, Ph.D., Associate Professor of Communication at the University of Wyoming, appointed by the School of Journalism and Mass Communication

Nora R. Smith, M.S.N., Pediatric Trauma Nurse Coordinator at the Carolinas Medical Center in Charlotte, North Carolina, appointed by the School of Nursing

Paige Hall Smith, Ph.D., Assistant Professor of Public Health Education at the University of North Carolina at Greensboro, appointed by the Department of Maternal and Child Health

William C. Smith, Ph.D., Professor of International Studies at the University of Miami, appointed by the Department of Political Science

Christopher Sneider, Ph.D., Professor of Astronomy at the University of Texas at Austin, appointed by the Department of Physics and Astronomy

Arthur J. Spivack, Ph.D., Professor of Chemistry at the University of North Carolina at Wilmington, appointed by the Curriculum in Marine Sciences

Thomas A. Spragens Jr., Ph.D., Professor of Political Science at Duke University, appointed by the Department of Political Science

Jonathan S. Stamler, M.D., Professor of Medicine at Duke University Medical Center, appointed by the School of Pharmacy

Orin Starn, Ph.D., Assistant Professor of Cultural Anthropology at Duke University, appointed by the Department of Anthropology

Roland Stephen, Ph.D., Assistant Professor of Political Science and Public Administration at North Carolina State University, appointed by the Department of Political Science

Charlotte A. Stuewe, Ph.D., Clinical Assistant Professor of Epidemiology at Columbia University School of Public Health, appointed by the Department of Maternal and Child Health

Gerald D. Sunth, Ph.D., Associate Professor of History at North Carolina State University, appointed by the Department of History

William H. Swallow, Ph.D., Professor of Statistics at North Carolina State University, appointed by the Department of Environmental Sciences and Engineering

Harry S. Swartzwelder, Ph.D., Associate Clinical Professor of Medical Psychology at Duke University Medical Center, appointed by the Department of Pharmacology

Katherine Swenson, Ph.D., Assistant Professor of Molecular Cancer Biology at Duke University, appointed by the Department of Biology

Sidney Tarrow, Ph.D., Professor of Government at Cornell University, appointed by the Department of Sociology

Marilyn J. Telen, M.D., Professor of Medicine at Duke University Medical Center, appointed by the Department of Pharmacology

Carol Tenopir, Ph.D., Professor of Information Sciences at the University of Tennessee, appointed by the School of Information and Library Science

Paul Tesar, Ph.D., Professor of Architecture and Design at North Carolina State University, appointed by the Department of City and Regional Planning

David Thomas, M.B.A., Associate Dean for Corporate & Community Relations, Emeritus, appointed by the School of Education

Erik Thomas, Ph.D., Assistant Professor of English at North Carolina State University, appointed by the Department of Linguistics

John H. Thompson, Ph.D., Professor of History at Duke University, appointed by the Department of History

Karl B. Thor, Ph.D., Chief Scientific Officer and Senior Vice President Research at GenPro Inc., Pharmaceutical Product Development Inc., appointed by the Department of Psychology

Susan E. Thorne, Ph.D., Assistant Professor of History at Duke University, appointed by the Department of History

Raymond R. Tice, Ph.D., Senior Vice President of Integrated Laboratory Systems, appointed by the Department of Environmental Sciences and Engineering

Sue Tolleson-Rinehart, Ph.D., Program Administrator, UNC-Chapel Hill Program in Health Outcomes and Director of Administration Center for Education and Research on Therapeutics, appointed by the School of Nursing

Donald Tomaskovic-Devey, Ph.D., Professor of Sociology at North Carolina State University, appointed by the Department of Sociology
Fernando M. Torres-Gil, Ph.D., Professor of Social Welfare at the University of California, appointed by the Department of History
John A. Trangenstein, Ph.D., Professor of Mathematics at Duke University, appointed by the Department of Environmental Sciences and Engineering
George A. Truskey, Ph.D., Associate Professor of Biomedical Engineering at Duke University, appointed by the School of Pharmacy
James Trussell, Ph.D., Director of Office of Population Research at Princeton University, appointed by the Department of Biostatistics
William Tumas, Ph.D., Group Leader and Research Scientist at Los Alamos National Laboratory, appointed by the Department of Environmental Sciences and Engineering
Timothy G. Turkington, Ph.D., Assistant Research Professor of Radiology at Duke University Medical Center, appointed by the Department of Biomedical Engineering
H. Rutherford Turnbull III, LL.B., J.D., Professor of Special Education at the University of Kansas, appointed by the Department of Public Policy
Gregory H. Tuttle, M.D., Director, UNC-Chapel Hill Division of Clinical Medicine and Team Physician, Division of Sports Medicine, appointed by the Department of Exercise and Sport Science
W. Randolph Umberger Jr., Ph.D., Professor of Dramatic Art at North Carolina Central University, appointed by the Department of Classics
Dean L. Urban, Ph.D., Assistant Professor of Environmental Studies at Duke University, appointed by the Curriculum in Ecology
Michiel J. M. Van Oort, Ph.D., Group Leader of Inhalation Product Development at Glaxo Wellcome pharmacy, appointed by the School of Pharmacy
Augusto E. Varas, Ph.D., Ford Foundation Andean Region and Southern Cone Office Representative, appointed by the Department of Political Science
Dharni Vasudevan, Ph.D., Assistant Professor at Nicholas School of the Environment at Duke University, appointed by the Department of Environmental Sciences and Engineering
Charles J. Vieck Jr., Professor of Neuroscience at the University of Florida College of Medicine, appointed by the Department of Biomedical Engineering
Teresa M. Vilaros, Ph.D., Associate Professor of Romance Studies at Duke University, appointed by the Department of Romance Languages
Rytas Vilgalys, Ph.D., Associate Professor of Botany at Duke University, appointed by the Department of Biology
K. Steven Vincent, Ph.D., Professor of History at North Carolina State University, appointed by the Department of History
Olafr von Ramm, Ph.D., Professor of Biomedical Engineering at Duke University, appointed by the Department of Biomedical Engineering
Ellen M. Voorhees, Ph.D., Research Scientist, National Institute of Standards and Technology, appointed by the School of Information and Library Science
Robert D. Voykner, Ph.D., Senior Research Mass Spectrometrist at Research Triangle Institute, appointed by the School of Pharmacy
Grant Wacker, Ph.D., Associate Professor of Religion at Duke University, appointed by the Department of Religious Studies
Stephen A. Wainwright, James B. Duke Professor of Zoology, Emeritus, Duke University, appointed by the Department of Biology
Altina L. Waller, Ph.D., Professor and Head of Department of History at the University of Connecticut at Storrs, appointed by the Department of History
Christopher Lee Waller, Ph.D., Research Investigator at Oncogene Science, Incorporated, appointed by the School of Pharmacy
Nina B. Wallerstein, Ph.D., Associate Professor of Public Health at the University of New Mexico, appointed by the Department of Health Behavior and Health Education
Clara R. Walters, M.S., Referral and Triage Nurse for UNC Physicians and Associates' Health Link, appointed by the School of Nursing
Caroline C. Wang, Dr.P.H., Assistant Professor of Health Behavior and Health Education at the University of Michigan School of Public Health, appointed by the Department of Health Behavior and Health Education
Paul P. Wang, Ph.D., Professor of Electrical and Computer Engineering at Duke University, appointed by the Department of Geophysical Sciences
William P. Watkins, Ph.D., Research Physiologist for Health Effects Research Laboratory at United States Environmental Protection Agency Dissertation Committees, appointed by the Department of Environmental Sciences and Engineering
Gerhard L. Weinberg, Ph.D., William R. Kenan Jr. Professor, appointed by the Department of History
Elizabeth A. Weir, Ed.D., Associate Professor of Education at Meredith College, appointed by the School of Education
Peter Weirzel, A.B., Executive Director of the North Carolina Center on Actual Innocence Master's Thesis, appointed by the School of Journalism and Mass Communication
Tracey L. Weldon, Ph.D., Assistant Professor of English at North Carolina State University, appointed by the Department of Linguistics
Byron R. Wells, Ph.D., Professor of Romance Languages at Wake Forest University, appointed by the Department of Romance Languages
Jennie C. Wengler, Ph.D., Research Analyst, The C N A Corporation, appointed by the Department of Public Policy
Kurt Weyland, Ph.D., M.A., Associate Professor of Political Science at Vanderbilt University, appointed by the Department of Political Science
Douglas R. White, Ph.D., Professor of Anthropology and Social Science at the University of California at Irvine, appointed by the Department of Sociology
Lucie E. White, J.D., Professor of Law at Harvard Law School, appointed by the Department of History
L. Graham Whitesell Jr., Ph.D., Senior Research Leader for Physical Pharmacy at Glaxo Wellcome, appointed by the School of Pharmacy
Michael Whittlesey, Coach/Assistant Lecturer, Athletics, UNC-Chapel Hill, appointed by the Department of Exercise and Sport Science
Beverly B. Wiggins, Ph.D., Associate Director for Research Development at Institute for Research In Social Science, appointed by the Department of Sociology
Ronda M. Wilkerson, Ph.D., Clinical Associate Professor of Education
Alan L. Williams, Ph.D., Scientific Review Administrator at the National Institutes of Health, appointed by the Department of Biology
Redford B. Williams, M.D., Professor of Medicine at Duke University Medical Center, appointed by the School of Nursing
Valerie S. L. Williams, Ph.D., Research Scientist Department of Psychology at North Carolina Central University, appointed by the Department of Psychology
Deborah Willis, M.A., Professor of Photography and Imaging at New York University, appointed by the School of Journalism and Mass Communication
Nathaniel C. Wilson, M.S., Hydrogeologist for the North Carolina Division of Water Resources, appointed by the Department of Environmental Sciences and Engineering

Carol Wise, Ph.D., Associate Professor, School of Advanced International Studies, John Hopkins University, appointed by the Department of Political Science

F. Charles Wiss, Ph.D., Clinical Director of the Whitaker School, appointed by the School of Education

Margaret Wolfe, M.S.N., Public Health Nurse Supervisor at Durham County Health Department, appointed by the School of Nursing

Walter A. Wolfram, Ph.D., William Friday Distinguished Professor of English at North Carolina State University, appointed by the Department of Linguistics

Teresa L. Wood, Ph.D., Assistant Professor of Neuroscience and Anatomy at the Pennsylvania State University College of Medicine, appointed by the Department of Cell Biology and Anatomy

Wanda A. Wununee, Ph.D., M.B.A., Associate Professor of Native Studies at the University of Manitoba, Canada, appointed by the Curriculum in Ecology

Yiju Yao, Ph.D., Associate Professor of Computer Science at the University of Regina, Canada, appointed by the School of Information and Library Science

Ajit Pritihiyraj Yoganathn, Ph.D., Professor of Biomedical Engineering at the Georgia Institute of Technology, appointed by the Department of Biomedical Engineering

Atef O. Zaghoul, Ph.D., Senior Software Engineer at Networking Hardware Division of IBM Corporation, appointed by the Department of Operations Research

Francisco Zapata, Ph.D., Professor of Sociology for the Centro de Estudios Sociologicos at El Colegio De Mexico, Mexico City, Mexico, appointed by the Department of Political Science

Gary A. Zakkin, Ph.D., Program Director of Health and Human Resource Economics Program at Research Triangle Institute, appointed by the Department of Economics

Wei Zhu, Ph.D., Technical Staff member at Bell Labs/Lucent Technology, appointed by the Department of Physics and Astronomy

Fabio Zicker, Ph.D., Manager, Program for Research and Training in Tropical Diseases, UNDP/World Bank/World Health Organization, Switzerland, appointed by the Department of Health Policy and Administration
Appendix

Residence Status for Tuition Purposes


The following sections summarize important aspects of the residency law. A complete explanation of the statute and the procedures under the statute is contained in A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes (hereafter referred to as "the manual"). This manual and other information concerning the application of this law are available for inspection in the Admissions Offices of the University. Copies of the manual are also on reserve at the Robey B. House Undergraduate Library and in the Reserve Reading Room of the Health Sciences Library. All students are responsible for knowing the contents of the statute and the manual.

Every applicant for admission is required to make a statement of his or her length of residence in North Carolina. A person who qualifies as a resident for tuition purposes under North Carolina law pays a lower rate of tuition than a nonresident. To qualify for in-state tuition, a legal resident must have been domiciled in North Carolina for at least twelve months immediately prior to the beginning of the term for which classification as a resident for tuition purposes is sought. The student must also establish that his or her presence in the state during such twelve-month period was for purposes of maintaining a bona fide domicile rather than for purposes of maintaining a temporary residence incident to enrollment in an institution of higher education. Domicile means one's permanent home of indefinite duration, as distinguished from a temporary place of abode. Domicile is synonymous with legal residence and is established by being physically present in a place with the concurrent intent to make that place a domicile. To determine intent, the University evaluates an individual's objectively verifiable conduct as an indicator of his or her state of mind.

Procedural Information

General. A student admitted to initial enrollment in an institution (or permitted to reenroll following an absence that involved a formal withdrawal from enrollment) is classified by the admitting institution either as a resident or as a nonresident for tuition purposes prior to actual matriculation. In the absence of a current and final determination of the student's residence prior to matriculation, the student is classified as a nonresident for tuition purposes. The institution will thereafter reach a final determination of the student's residence status. Unless a person supplies enough information to allow the admissions officer to classify him or her as a resident for tuition purposes, the person will be classified as a nonresident for tuition purposes. A residence classification once assigned (and confirmed pursuant to any appellate process involved) may be changed thereafter (with a corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic calendar.

Transfer Students. When a student transfers from one North Carolina public institution of higher education to another, he or she is required to be treated as a new student by the institution to which he or she is transferring and must be assigned an initial residence classification for tuition purposes. The residence classification of a student by one institution is not binding on another institution. The North Carolina institutions of higher education will assist each other by supplying residency information and classification records concerning a student to another classifying institution upon request. A student or prospective student who wants the University to consider his or her "resident" classification by another North Carolina public higher education institution must include, with his or her application for resident status, copies of all the information that was before the other institution at the time that institution classified the student a resident for tuition purposes.

The transfer into or admission to a different component of the same institution (e.g., from an undergraduate to a graduate or professional program) is not construed as a transfer from one institution to another and thus does not by itself require a reclassification inquiry unless (1) the affected student requests a reclassification inquiry or (2) the transfer or enrollment occurs following the lapse of more than one quarter, semester, or term during which the individual was not enrolled as a student.

Responsibility of Students. Any student who is uncertain about the accuracy of his or her current residence classification for tuition purposes is responsible for securing a ruling by completing an application for resident status and filing it with the admissions officer. The student who subsequently becomes eligible for a change in classification, whether from out-of-state to in-state or the reverse, is responsible for immediately informing the Office of Admissions in writing of his or her new status. Failure to give complete and correct information regarding residence constitutes grounds for disciplinary action.

Application Process. A person may obtain an application for resident status from his or her admissions office. Applicants for admission who claim eligibility for the in-state tuition rate customarily complete a two-page residency application as a part of the admissions application packet. Some applicants for admission will thereafter be required to complete a more detailed four-page residency application. Enrolled students seeking a change from nonresident to resident status are required to complete a four-page residency application. All applications for resident status must be filed with the proper admissions office before the end of the term for which resident status for tuition purposes is sought. The last day of the final examination period is considered the last day of the term.

After filing a resident status application, a person may receive a letter from his or her admissions office requesting more information in connection with that application. When a student receives such a request before the end of the term for which classification is sought, he or she must respond to that request no later than three weeks after the end of the term. If the student does not respond to the request for supplemental information after the end of the term in question, he or she must supply the requested information within three weeks after receipt of the request. Failure to supply the requested information within the specified time limit will result in a continuation of the student's nonresident classification unless good cause is shown for such failure.

The admissions office may require an applicant for admission to file a residency application or respond to a request for more information more quickly when resident status is a factor in the admissions decision.

The pamphlet Information About Resident Status for Tuition Purposes contains more details about the residency application process and is available at all admissions offices.

Fraudulent Applications. If a student is classified as a resident for tuition purposes after submitting falsified residency information or after knowingly withholding residency information, the student's application for in-state tuition status is fraudulent.

The institution may reexamine any application suspected of being fraudulent and, if warranted, will change the student's status retroactively to the beginning of the term for which the student originally made the fraudulent application. If this occurs, the student must pay the out-of-state tuition differential for all the enrolled terms intervening between the fraudulent application and its discovery. Further, knowing falsification of responses on a resident status application may subject the applicant to disciplinary action, including dismissal from the institution.
Burden of Proof and Statutory Prima Facie Evidence. A person has the burden of establishing facts that justify his or her classification as a resident for tuition purposes. The balancing of all the evidence must produce a preponderance of evidence supporting the assertion of in-state residence. Under the statute, proof of resident status is controlled initially by one of two evidentiary beginning points which are stated in terms of prima facie evidence.

a. Even if the person is an adult, if his or her parents (or court-appointed guardian in the case of some minors) are not legal residents of North Carolina, this is prima facie evidence that the person is not a legal resident of North Carolina unless he or she has lived in this state the five consecutive years prior to enrolling or re-registering. To overcome this prima facie showing of nonresidence, a person must produce evidence that he or she is a North Carolina domiciliary despite the parents' nonresident status.

b. Conversely, if the person's parents are domiciliaries of North Carolina under the Statute, this fact constitutes prima facie evidence that the person is a domiciliary of North Carolina. This prima facie showing may also be overcome by other evidence to the contrary. If a person has neither living parents nor legal guardian, the prescribed prima facie evidence rule cannot and does not apply.

Erroneous Notices Concerning Classification. If a student who has been found to be a nonresident for tuition purposes receives an erroneous written notice from an institutional officer identifying the student as a resident for tuition purposes, the student is not responsible for paying the out-of-state tuition differential for any enrolled term beginning before the classifying institution notifies the student that the prior notice was erroneous.

Grace Period. If a student has been properly classified as a North Carolina resident for tuition purposes and, thereafter, his or her state of legal residence changes while he or she is enrolled in a North Carolina public institution of higher education, the statute provides for a grace period during which the student is allowed to pay tuition at the in-state rate despite the fact that the student is no longer a North Carolina legal resident. This grace period extends for a minimum of twelve months from the date of change in legal residence, and if the twelve-month period ends during a semester or academic term in which the student is enrolled, the grace period extends also to the end of that semester or academic term.

Reacquisition of Resident Tuition Status. The prescribed twelve-month period of legal residence may be shortened if the person seeking to be classified as a resident for tuition purposes was formerly classified a North Carolina resident for tuition purposes, abandoned North Carolina domicile, and reestablished North Carolina domicile within twelve months after abandoning it. Interested persons should consult their admissions offices for a detailed explanation of the conditions which must be met to qualify under this section.

Appeals. A student appeal of a classification decision made by any admissions officer must be in writing and signed by the student and must be filed by the student with that officer within fifteen working days after the student receives notice of the classification decision. The appeal is transmitted to the Residence Status Committee by that officer, who does not vote in that committee on the disposition of such appeal. The student is notified of the date set for consideration of the appeal, and on request of the student, he or she is afforded the opportunity to appear and be heard by the committee. Any student desiring to appeal a decision of the Residence Status Committee must give notice in writing of that fact (within ten days of receipt of the committee's decision) to the chairman of the Residence Status Committee, and the chairman promptly processes the appeal for transmittal to the State Residence Committee.

Tuition Payment. It is the responsibility of the student to pay tuition at the rate charged and billed while an appeal is pending. In effect, the student who is classified a nonresident at the time of tuition billing pays the nonresident rate. Conversely, if a student is classified as a resident at the time of billing, he or she pays the resident rate. Any necessary adjustments in the rate paid will be made at the conclusion of the appeal.

If a student withdraws from the University during a fall or spring semester, tuition and fees will be prorated over a period of nine weeks at a rate of one-tenth of the term's bill each week after deduction of an administrative charge. If a student withdraws during a summer session, tuition and fees will be prorated over a period of three weeks at a rate of one-fourth of the term's bill each week after deduction of the administrative charge. If a student drops the only course he or she is taking, this constitutes a withdrawal from the University.

Application of the Law to Specific Situations

Aliens. Aliens who are permanent residents of the United States, or who hold a visa that will permit eventual permanent residence in the United States, are subject to the same considerations with respect to determination of legal residence as citizens. An alien abiding in the United States under a visa conditioned at least in part upon intent not to abandon a foreign domicile (B, F, J, P, Q, and S visas) cannot be classified a resident. An alien abiding in the United States under a visa issued for a purpose that is so restricted as to be fundamentally incompatible with an assertion by the alien of bona fide intent to establish a legal residence (C, D, M, and R visas) cannot be classified a resident.

Possession of certain other immigration documents may also allow an alien to be considered for in-state tuition status. For more details, aliens should consult their admissions offices and the manual. Aliens must file a Residence Status Supplemental Form in addition to the forms normally required of applicants for resident status for tuition purposes.

Married Persons. The domicile of a married person, irrespective of sex, is determined by reference to all relevant evidence of domiciliary intent. No person is precluded, solely by reason of marriage to a person domiciled outside of North Carolina, from establishing or maintaining legal residence in North Carolina. No person is deemed, solely by reason of marriage to a person domiciled in North Carolina, to have established or maintained a legal residence in North Carolina. The fact of marriage and the place of the domicile of the student's spouse are deemed relevant evidence to be considered in ascertaining domiciliary intent.

If a person otherwise can demonstrate compliance with the fundamental statutory requirement that he or she be a legal resident of North Carolina before the beginning of the term for which resident status is sought, the second statutory requirement relating to duration of residence may be satisfied derivatively, in less than twelve months, by reference to the length of the legal residence of the person's spouse, if the spouse has been a legal resident of the state for the requisite twelve-month period.

Military Personnel. The domicile of a person employed by the federal government is not necessarily affected by assignment in or reassignment out of North Carolina. Such a person may establish domicile by the usual requirements of residential act plus intent. No person loses his or her in-state resident status solely by serving in the armed forces outside of the state of North Carolina.

Minors. A minor is any person who has not reached the age of eighteen years. Under the common law, a minor child whose parents are not divorced or legally separated is presumed to have the domicile of his or her father. This presumption may be rebutted if a preponderance of the evidence indicates that the mother and father have separate domiciles and that, under the circumstances, the child can fairly be said to derive his or her domicile from the mother. If the father is deceased, the domicile of the minor is that of the surviving mother. If the parents are divorced or legally separated, the domicile of the minor is that of the parent having custody by virtue of a court order; or, if no custody has been granted by virtue of court order, the domicile of the minor is that of the parent with whom he or she lives; or, if the minor lives with neither parent, in the absence of a custody award, the domicile of the minor is presumed to remain that of the father. If the minor lives for part of the year with each parent, in the absence of a custody award, the minor's domicile is presumed to remain that of the father. If the minor has lived in North Carolina for five years as set forth above in Burden of Proof and Statutory Prima Facie Evidence, subsection a, the common law presumptions do not absolutely control on the issue of the minor's domicile, but they continue to be very strong evidence thereof.

In determining residence status for tuition purposes, there are three exceptions to the above provisions:

1. If a minor's parents are divorced, separated, or otherwise living apart and one parent is a legal resident of North Carolina, during the time period when that parent is entitled to claim, and does claim, the minor as a dependent on the North Carolina individual income tax return, the minor is deemed to be a legal
resident of North Carolina for tuition purposes, notwithstanding any judicially determined custody award with respect to the minor.

If immediately prior to his or her eighteenth birthday a person would have been deemed a North Carolina legal resident under this provision but he or she achieves majority before enrolling in a North Carolina institution of higher education, that person will not lose the benefit of this provision if the following conditions are met:

a. Upon achieving majority the person must act, as much as possible, in a manner consistent with bona fide legal residence in North Carolina; and
b. The person must begin enrollment at a North Carolina institution of higher education not later than the fall academic term next following completion of education prerequisite to admission at the institution.

2. If immediately prior to beginning an enrolled term the minor has lived in North Carolina for five or more consecutive years in the home of an adult relative (other than a parent) who is a legal resident of North Carolina, and if the adult relative during those years has functioned as a de facto guardian of the minor, then the minor is considered a legal resident of North Carolina for tuition purposes. If a minor qualified for resident status for tuition purposes under this provision immediately prior to his or her eighteenth birthday, then, upon becoming eighteen, he or she will be deemed a legal resident of North Carolina of at least twelve months' duration.

3. Even though a person is a minor, under certain circumstances the person may be treated by the law as being sufficiently independent from his or her parents as to enjoy a species of adulthood for legal purposes. If the minor marries or obtains a judicial decree of emancipation under N.C. Gen. Stat. Sect. 7A-717, et seq., he or she is emancipated. The consequence, for present purposes, of such emancipation is that the affected person is presumed to be capable of establishing a domicile independent of that of the parents; it remains for that person to demonstrate that a separate domicile has, in fact, been established.

Prisoners. There are special provisions concerning domicile of prisoners. For more information, persons to whom these provisions may apply should consult the manual.

Property and Taxes. Ownership of property in or payment of taxes to the State of North Carolina apart from legal residence will not qualify one for the in-state tuition rate.

Students or prospective students who believe that they are entitled to be classified residents for tuition purposes should be aware that the processing of requests and appeals can take a considerable amount of time. A student is more likely to obtain a final decision on an application before tuition payment is due if he or she files the application several months in advance.

Military Tuition Benefit


Certain members of the Armed Services and their dependent relatives who are not residents for tuition purposes may become eligible to be charged less than the out-of-state tuition rate under N.C. Gen. Stat. Sect. 116-143.3, the military tuition benefit provision. Any person seeking the military tuition benefit must qualify for admission to UNC-Chapel Hill and must file an application for the benefit with his or her admissions office before the first day of classes of the term for which he or she initially seeks the benefit. To remain eligible to receive the military tuition benefit, he or she must file another application for the benefit before the first day of classes of the first term in which he or she is enrolled in each academic year. The burden of proving eligibility for the military tuition benefit lies with the applicant for the benefit, and the application and all required supporting affidavits must be complete and in proper order before the first day of classes of the term in question. Because of the time involved in securing the necessary affidavits from the appropriate military authorities, prospective applicants for the military tuition benefit are urged to secure application forms from their admissions offices and begin the application process several weeks before the first day of classes of the term for which they seek the benefit.

Eligibility of Members of the Armed Services. Eligible members of the Armed Services pay a rate of tuition computed by applying a statutory formula which is dependent, in part, on the amount of money payable by their Service employer to them or to the institution by reason of their enrollment. Application of the statutory formula yields the following results: if the service member's education is being fully funded by the Service employer, the amount of tuition owed is equal to out-of-state tuition; if the member's education is not being funded by his or her Service employer, he or she pays an amount equal to in-state tuition; and if the Service employer is providing partial educational funding, the amount of tuition owed depends on the amount of funding contributed by the Service employer.

To be eligible for this military tuition benefit, the individual must be:

a. a member of the United States Air Force, Army, Coast Guard, Marine Corps, Navy, North Carolina National Guard, or a reserve component of one of these services, and
b. abiding in North Carolina incident to active military duty performed at or from a duty station in North Carolina.

Eligibility of Dependent Relatives of Service Members. If the service member meets the conditions set forth above, his or her dependent relatives may be eligible to pay the in-state tuition rate if they share the service member's North Carolina abode, if they have complied with the requirements of the Selective Service System (if applicable), and if they qualify as military dependents of the service member.

If the service member voluntarily ceases to live in North Carolina or is involuntarily absent from the state on military orders (other than absences on routine maneuvers and temporary assignments), he or she is deemed to have moved his or her abode from North Carolina. If a dependent relative of a service member has become eligible for the military tuition benefit, and after the beginning of the term of eligibility the service member moves his or her abode from North Carolina, the dependent relative will continue to be eligible for the military tuition benefit only for the remainder of that academic year. An academic year runs from the first day of classes of the fall semester through the last day of exams of the following summer session, second term.

For a detailed explanation of the military tuition benefit provision (including an explanation of the formula used to compute the tuition rate for service members), a complete list of categories of persons who are considered "dependent relatives" for purposes of establishing eligibility for the military tuition benefit, and information about the registration requirements of the Selective Service System, applicants should consult A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes (as amended September 1985). This manual is available for inspection in the Admissions Offices of the University. Copies of the manual are also on reserve at the Robert B. House Undergraduate Library and in the Reserve Reading Room of the Health Sciences Library.

Appeals of Eligibility Determinations of Admissions Officers. A student appeal of an eligibility determination made by any admissions officer must be in writing and signed by the student and must be filed by the student with that officer within fifteen working days after the student receives notice of the eligibility determination. The appeal is transmitted to the Residence Status Committee by that officer, who does not vote in that committee on the disposition of such appeal. The student is notified of the date set for consideration of the appeal, and, on request by the student, is afforded an opportunity to appear and be heard by the committee.

Any student desiring to appeal a determination of the Residence Status Committee must give notice in writing of that fact to the chairman of the Residence Status Committee within ten days of receipt of the committee's decision. The chairman will promptly process the appeal for transmittal to the State Residence Committee.

North Carolina Teachers' Tuition Benefit

The information in this section comes from two sources: (1) North Carolina General Statutes Section 116-143.5, and (2) University of North Carolina Administrative Memorandum No. 375 dated October 22, 1997.
Certain North Carolina teachers may become eligible to be charged the in-state tuition rate even if they do not qualify as residents for tuition purposes under G.S. 116-143.1. These applicants may receive the benefit for courses “relevant to teacher certification or to professional development as a teacher” if approved by the principal of the applicant’s school.

To qualify, an applicant must be a teacher or other person paid on the North Carolina teacher salary schedule incident to full-time employment by a North Carolina public school. “Full-time employment” means the employee’s duties qualify him/her for membership in the Teachers and State Employees Retirement System or would so qualify the employee if he/she were employed on a permanent basis. Applicants must qualify academically for admission to any school of UNC-Chapel Hill.

Additionally, to be eligible, he or she must be a North Carolina legal resident (domiciliary) and must have established North Carolina domicile before the commencement of the approved course(s). However, he or she does not have to have been a legal resident for twelve months.

To apply for the benefit, applicants must submit the following documents to the proper admissions office no later than the first day of classes of the term for which this benefit is sought:

• a completed N.C. Teachers Tuition Benefit application,

• a completed “Principal’s Declaration for In-State Tuition Benefit for N.C. Teachers,” and

• a four-page application for resident tuition status.

For a detailed explanation of the teachers tuition benefit law and to acquire application forms, applicants should contact the appropriate admissions office.

Information concerning the application of this law is on reserve at the Undergraduate Library and Health Sciences Library and is also available at all admissions offices and the Residence Status Committee office.

Appeals of Eligibility Determinations of Admissions Offices must be in writing and signed by the applicant and must be filed by the applicant with that admissions officer within fifteen working days after the applicant receives notice of the eligibility determination. The appeal is submitted to the Residence Status Committee by that officer, who does not vote in that committee on the disposition of such appeal. The applicant is notified of the date set for consideration of the appeal, and, on request by the applicant, is afforded an opportunity to appear and be heard by the committee.

Any applicant desiring to appeal a determination of the Residence Status Committee must give written notice of that fact to the chairman of the Residence Status Committee within ten days of receipt of the committee’s decision. The chairman will promptly process the appeal for transmittal to the State Residence Committee.

Tuition Waiver for Family Members of Deceased or Disabled Emergency Workers

The information in this section comes from three sources: (1) North Carolina General Statutes Section 115B-1 et seq., (2) University of North Carolina Administrative Memorandum No. 377 dated November 17, 1997, and (3) University of North Carolina Administrative Memorandum No. 385 dated August 6, 1998.

Certain family members of emergency workers killed or permanently disabled in the line of duty may become eligible for tuition-free enrollment.

The statute sets out the following requirements that must be met before the waiver can be obtained:

• the deceased or disabled emergency worker (firefighter, volunteer firefighter, law enforcement officer, or rescue squad member) must have been a North Carolina legal resident (domiciliary), in active service or training for active service at the time of death or disability occurring in the line of duty;

• the emergency worker’s death or disability must have occurred on or after October 1, 1997;

• the emergency worker must have been employed by the State of North Carolina or any of its departments, agencies, or institutions, OR a county, city, town or other political subdivision of the State of North Carolina;

• the applicant for the tuition waiver must be either a child or unmarried widow or widower of a deceased emergency worker killed in the line of duty, OR a spouse or a child (at least age 17, but not yet 23) of an emergency worker who became permanently and totally disabled as a result of a traumatic injury sustained in the line of duty as an emergency worker;

• the applicant must qualify academically for admission to UNC-Chapel Hill, must meet all the requirements of the statute and implementing University regulations, and there must be space available in the course(s) for which he or she intends to register;

• the completed application, with all supporting documents, must be submitted to the proper admissions office no later than the first day of class of the term for which the waiver is sought. If the applicant is under 18 years of age, a parent must also sign.

The following documents are required as proof of eligibility for this tuition waiver:

To prove permanent and total disability of an emergency worker - Documentation of the permanent and total disability from the N.C. Industrial Commission

To prove cause of death of an emergency worker - Certification of the cause of death from

1. The Department of State Treasurer; or

2. The appropriate city or county law enforcement agency that employed the deceased; or

3. The administrative agency for the fire department or fire protection district funded under the Department of State Auditor; or

4. The administrative agency having jurisdiction over any paid firefighters of all counties and cities.

To prove the parent/child relationship - applicant’s birth certificate or legal adoption papers

To prove the marital relationship - applicant’s marriage certificate

Copies of the applicable law and implementing University regulations are on reserve in the Undergraduate Library and the Health Sciences Library. They are also available for inspection upon request in all UNC-Chapel Hill admissions offices and the Residence Status Committee Office. Applications can be acquired at the proper admissions office.

Appeals of Eligibility Determinations of Admissions Offices must be in writing and signed by the applicant and must be filed by the applicant with that admissions officer within fifteen working days after the applicant receives notice of the eligibility determination. The appeal is submitted to the Residence Status Committee by that officer, who does not vote in that committee on the disposition of such appeal. The applicant is notified of the date set for consideration of the appeal, and, on request by the applicant, is afforded an opportunity to appear and be heard by the committee.

Any applicant desiring to appeal a determination of the Residence Status Committee must give written notice of that fact to the chairman of the Residence Status Committee within ten days of receipt of the committee’s decision. The chairman will promptly process the appeal for transmittal to the State Residence Committee.

Family Educational Rights and Privacy Act

As a general rule, under the federal Family Educational Rights and Privacy Act (FERPA), personally identifiable information may not be released from a student’s education records without his or her prior written consent. Exceptions to this rule are set out in the FERPA regulations and the FERPA policy of The University of North Carolina at Chapel Hill. A few of the exceptions are listed below.

The University will disclose personally identifiable information from a student’s education records to officials of another school or school system in which the student seeks or intends to enroll and to officials of another school or school system in which a currently-enrolled UNC-Chapel Hill student is contemporaneously enrolled.

If the University takes disciplinary action against a student for conduct that posed a significant risk to the safety or well-being of the student, other students, or members of the University community, the University may disclose information about that disciplinary action to officials of other schools who have a legitimate educational interest in the student’s behavior.
If the University, pursuant to campus disciplinary procedures, finds that a student has committed a violation of the Code of Student Conduct that constitutes a crime of violence or a nonforcible sex offense, the University will, upon request, disclose the name of the student, the violation committed, and any disciplinary sanction imposed on the student.

The University will release information from a student's education records to other school officials (including teachers, officials and employees of UNC-Chapel Hill and officials and employees of the Office of General Administration of The University of North Carolina) who have a legitimate educational interest in the information. A school official has a 'legitimate educational interest' if it is in the educational interest of the student in question for the official to have the information, or if it is necessary or desirable for the official to obtain the information in order to carry out his or her official duties or to implement the policies of The University of North Carolina.

The University makes public certain information that has been designated as "directory information" unless the student has notified the Office of the University Registrar to restrict the release of this information. The University considers the following to be "directory information": the student's name; address (local and grade/billing addresses); student e-mail address; telephone listing (local and grade/billing telephone numbers); date and place of birth; county, state and/or United States territory from which the student entered the University; major field of study; class (freshman, senior, etc.); enrollment status (full-time, half-time, or part-time); Person ID Number (PID); anticipated graduation date; participation in officially recognized activities and sports; weight and height of members of athletic teams; dates of attendance; degrees and awards received; and the most recent previous educational agency or institution attended by the student. The University also publishes the Campus Directory annually, and some professional and graduate student groups publish directories of students in their departments or schools.

Students who wish to restrict how address information is primed in the Campus Directory, or who wish to have all directory information restricted, must notify the Office of the University Registrar in writing. A "Request for Non-Disclosure of Information" form available in 105 Hanes Hall, gives students certain options about release of information on campus. The Office of the University Registrar will accept the request forms at any time; however, it cannot guarantee a proper listing in the Campus Directory unless it receives the request by the end of the first week of classes in the fall.

Receipt of an approved master's thesis or doctoral dissertation in the Graduate School is tantamount to publication, and the thesis or dissertation will be available to the public in the University Library and available for interlibrary loan. Honors theses are also made available to the public through the University Library. Other student papers may be put in campus libraries or otherwise made public in accordance with individual course or program requirements.

The Family Educational Rights and Privacy Act also gives a student the right to inspect his or her education records and to request amendment of those records if they are inaccurate, misleading, or otherwise in violation of the student's privacy rights. To inspect his or her education records, a student must file a written request with the individual who has custody of the records that the student wishes to inspect. To request amendment of his or her records, a student first discusses the matter informally with the records custodian, and if the custodian does not agree to amend the records, he or she will inform the student of applicable appeal rights. Students also have the right to file a complaint with the U.S. Department of Education alleging that the University has not complied with FERPA.

Questions about FERPA should be addressed to Associate University Counsel (CB# 9150, 01 South Building). The University's FERPA policy is the text of the federal FERPA regulations are available on the world wide web at RegWeb.unc.edu/official/FERPA/. The text of the statute and regulations and the University's FERPA policy are also available for inspection in 01 South Building.

Expulsion

A student who has been expelled from an institution in the University of North Carolina system may not be admitted to another UNC-system school unless the institution that originally expelled the student rescinds that expulsion.

Fireworks, Firearms, and Other Weapons

Possessing or carrying, openly or concealed, any gun, rifle, pistol, or other firearm of any kind, or any dynamite cartridge, bomb, grenade, mine or powerful explosive on any University campus or in any University-owned or operated facility is unlawful and contrary to University policy and may constitute a violation of the Campus Code. Violation of this prohibition is a felony punishable by fine and/or imprisonment.

Possessing or carrying any BB gun, stub gun, air rifle, air pistol, bowie knife, dirk, dagger, slingshot, loaded cane, switchblade knife, black jack, metallic knuckles, razors and razor blades (except for personal shaving), fireworks, or any sharp-pointed or edged instrument (except instructional supplies, unsheared nail files, and clips and tools used solely for preparation of food, instruction, and maintenance) upon any University campus or in any University-owned or operated facility is unlawful and contrary to University policy. Violation of this prohibition is a Class I misdemeanor punishable by fine and/or imprisonment, and may constitute a violation of the Campus Code.

Immunization Requirement

Effective July 1, 1986, North Carolina state law requires that no person shall attend a college or university in North Carolina unless a certificate of immunization indicating that the person has received the immunizations required by the law is presented to the college or university on or before the first day of matriculation.

If the UNC-Chapel Hill Medical History Form containing the certificate of immunization is not in the possession of the UNC-Chapel Hill Student Health Service ten days prior to the registration date, the University shall present a notice of deficiency to the person. The person shall have thirty calendar days from the first day of attendance to obtain the required immunizations. Those persons who have not complied with the immunization requirements by the end of thirty calendar days will be administratively withdrawn from the University.

Students' Education Records at General Administration of The University of North Carolina: Annual Notification of Rights

Certain personally identifiable information about students ("education records") may be maintained at The University of North Carolina General Administration, which serves the Board of Governors of the University system. This student information may be the same as, or derivative of, information maintained by a constituent institution of the University; or it may be additional information. Whatever their origins, education records maintained at General Administration are subject to the federal Family Educational Rights and Privacy Act of 1974 (FERPA).

FERPA provides that a student may inspect his or her education records. If the student finds the records to be inaccurate, misleading, or otherwise in violation of the student's privacy rights, the student may request amendment to the record. FERPA also provides that a student's personally identifiable information may not be released to someone else unless (1) the student has given a proper consent for disclosure or (2) provisions of FERPA or federal regulations issued pursuant to FERPA permit the information to be released without the student's consent.

A student may file with the United States Department of Education a complaint concerning failure of General Administration or an institution to comply with FERPA.

The policies of The University of North Carolina General Administration concerning FERPA may be inspected in the office at each constituent institution designated to maintain the FERPA policies of the institution. Policies of General Administration may also be accessed in the Office of the Secretary of The University of North Carolina, General Administration, 910 Raleigh Road, Chapel Hill, NC.

Further details about FERPA and FERPA procedures at General Administration are to be found in the referenced policies. Questions about the policies may be directed to Legal Section, Office of the President, The University of North Carolina, General Administration, Annex Building, 910 Raleigh Road, Chapel Hill, N.C. (mailing address P.O. Box 2688, Chapel Hill, N.C. 27515-2688; tel: 919-962-4588).
Policy on Illegal Drugs

Introduction.
The Board of Trustees of The University of North Carolina at Chapel Hill, in conformity with the direction of the Board of Governors of The University of North Carolina, hereby adopts this Policy on Illegal Drugs, effective August 24, 1988. It is applicable to all students, faculty members, administrators, and other employees.

Education, Counseling, and Rehabilitation.
A. The University of North Carolina at Chapel Hill has established and maintains a program of education designed to help all members of the University community avoid involvement with illegal drugs. This educational program emphasizes these subjects:
1. The incompatibility of the use or sale of illegal drugs with the goals of the University.
2. The legal consequences of involvement with illegal drugs;
3. The medical implications of the use of illegal drugs; and
4. The ways in which illegal drugs jeopardize an individual's present accomplishments and future opportunities.

B. The University of North Carolina at Chapel Hill provides information about drug counseling and rehabilitation services available to members of the University community through campus-based programs and through community-based organizations. Persons who voluntarily avail themselves of University services are hereby assured that applicable professional standards of confidentiality will be observed.

Enforcement and Penalties.
A. The University of North Carolina at Chapel Hill shall take all actions necessary, consistent with state and federal law and applicable University policy, to eliminate illegal drugs from the University community. The University's Policy on Illegal Drugs is publicized in catalog and other materials prepared for all enrolled and prospective students and in materials distributed to faculty members, administrators, and other employees.
B. Students, faculty members, administrators, and other employees are responsible, as citizens, for knowing about and complying with the provisions of North Carolina law that make it a crime to possess, sell, deliver, or manufacture those drugs designated collectively as controlled substances in Article 5 of Chapter 90 of the North Carolina General Statutes. Any member of the University community who violates that law is subject both to prosecution and punishment by the civil authorities and to disciplinary proceedings by the University. It is not "double jeopardy" for both the civil authorities and the University to proceed against and punish a person for the same specified conduct. The University will initiate its own disciplinary proceeding against a student, faculty member, administrator, or other employee when the alleged conduct is deemed to affect the interests of the University.
C. Penalties will be imposed by the University in accordance with procedural safeguards applicable to disciplinary actions against students, faculty members, administrators, and other employees, as required by Section 3 of the Trustee Policies and Regulations Governing Academic Tenure in The University of North Carolina at Chapel Hill; by Section III.D. of the Employment Policies for EPA Non-Faculty Employees of The University of North Carolina at Chapel Hill; by regulations of the State Personnel Commission; and the Disciplinary Procedure of the Staff Personnel Administration Guides (Human Resources Manual for SPA Employees), by the Instrument of Student Judicial Governance, and by all other applicable provisions of the policies and procedures of The University of North Carolina at Chapel Hill.
D. The penalties to be imposed by the University may range from written warnings with probationary status to expulsions from enrollment and discharges from employment. However, the following minimum penalties shall be imposed for the particular offenses described.

1. Trafficking in Illegal Drugs
   a. For the illegal manufacture, sale or delivery, or possession with intent to manufacture, sell or deliver, of any controlled substance identified in Schedule I, N.C. Gen. Stat. 90-89, or Schedule II, N.C. Gen. Stat. 90-90 (including, but not limited to, heroin, mescaline, lysergic acid diethylamide, opium, cocaine, amphetamine, methaqualone), any student shall be expelled and any faculty member, administrator, or other employee shall be discharged.
   b. For a first offense involving the illegal manufacture, sale or delivery, or possession with intent to manufacture, sell or deliver, of any controlled substance identified in Schedules III through VI, N.C. Gen. Stat. 90-91 through 90-94, (including, but not limited to, marijuana, anabolic steroids, penicillin, codeine), the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent. (Employees subject to the State Personnel Act are Governed by regulations of the State Personnel Commission. Because the minimum penalty specified in this Section and required by the Board of Governors exceeds the maximum period of suspension without pay that is permitted by State Personnel Commission regulations, the penalty for a first offense for employees subject to the State Personnel Act is discharge.) For a second offense, any student shall be expelled and any faculty member, administrator, or other employee shall be discharged.

2. Illegal Possession of Drugs
   a. For a first offense involving the illegal possession of any controlled substance identified in Schedule I, N.C. Gen. Stat. 90-89, or Schedule II, N.C. Gen. Stat. 90-90, the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent. (Employees subject to the State Personnel Act are Governed by regulations of the State Personnel Commission. Because the minimum penalty specified in this Section and required by the Board of Governors exceeds the maximum period of suspension without pay that is permitted by State Personnel Commission regulations, the penalty for a first offense for employees subject to the State Personnel Act is discharge.)
   b. For a first offense involving the illegal possession of any controlled substance identified in Schedules III through VI, N.C. Gen. Stat. 90-91 through 90-94, the minimum penalty shall be probation, for a period to be determined on a case-by-case basis. A person on probation must agree to participate in a drug education and counseling program, consent to regular drug testing, and accept such other conditions and restrictions, including a program of community service, as the Chancellor or the Chancellor's designee deems appropriate. Refusal or failure to abide by the terms of probation shall result in suspension from enrollment or from employment for any unexpired balance of the prescribed period of probation. (If this balance for an employee subject to the State Personnel Act exceeds one week, that employee shall be discharged.)
   c. For second or other subsequent offenses involving the illegal possession of controlled substances, progressively more severe penalties shall be imposed, including expulsion of students and discharge of faculty members, administrators, or other employees.

E. Suspension Pending Final Disposition. When a student, faculty member, administrator, or other employee has been charged by the University with a violation of policies concerning illegal drugs, he or she may be suspended from enrollment or employment before initiation or completion of regular disciplinary proceedings if, assuming the truth of the charges, the Chancellor, or in the Chancellor's absence, the Chancellor's designee concludes that the person's continued presence within the University community would constitute a clear and immediate danger to the health or welfare of other members of the University community; provided, that if such a suspension is imposed, an appropriate hearing of the charges against the suspended person shall be held as promptly as possible thereafter.

Implementation and Reporting

Annually, the Chancellor shall submit to the Board of Trustees a report on campus activities related to illegal drugs for the preceding year. The reports shall include, as a minimum, the following:
1. a listing of the major educational activities conducted during the year;
2. a report on any illegal drug-related incidents, including any sanctions imposed;
(3) an assessment by the Chancellor of the effectiveness of the campus programs; and
(4) any proposed changes in the Policy on Illegal Drugs.
A copy of the report shall be provided to the President, who shall confer with the Chancellor about the effectiveness of campus programs.

Alcoholic Beverages

The University’s Policy on Student Possession and Consumption of Alcoholic Beverages in Facilities of The University of North Carolina at Chapel Hill sets forth the conditions under which alcoholic beverages are consistent with Federal, State, and local laws and ordinances is permitted in University facilities and on University property.

According to North Carolina law:
A. Generally persons twenty-one or older may purchase or consume alcoholic beverages and may possess alcoholic beverages at their homes or temporary residences.
B. It is against the law for any person under twenty-one to purchase or possess any alcoholic beverage.
C. It is against the law for anyone to sell or give any alcoholic beverage to a person under twenty-one or to aid or abet such a person in selling, purchasing, or possessing any alcoholic beverage.
D. No alcoholic beverages may be sold by any person, organization, or corporation on a college campus except by a hotel or nonprofit alumni organization with a mixed beverages or special occasion permit. Both direct and indirect sales are unlawful.

According to Chapel Hill ordinance, it is against the law for anyone to possess any open alcoholic beverage on streets, sidewalks, alleys, or any other property owned or controlled by the Town of Chapel Hill.

In addition to following the law, the University’s Policy on Student Possession and Consumption of Alcoholic Beverages in Facilities of The University of North Carolina at Chapel Hill sets out special rules about alcohol for students and student organizations. The Office of the Dean of Students will provide copies of the policy and assistance in understanding its full implications. The text of the policy can be accessed on the World Wide Web at the following address: www.unc.edu/student/policies/alcohol.html.

A. Under the policy: Alcohol may not be served or consumed in any University building or open space except as provided in the University’s Guidelines for Serving Alcohol at University-Sponsored Events.
B. Alcohol may not be possessed or consumed at any campus athletic event or at any performance on campus, and alcohol may not be consumed at any outdoor campus location.
C. Common source containers of alcohol (e.g., kegs) are not permitted on campus.
D. Students and their guests aged twenty-one and older may possess and consume alcoholic beverages in individual campus residence hall rooms or apartments on campus, but not in the common areas of a campus residence hall.
E. No Student Activity Fees or other University-collected fees may be used to purchase alcohol.
F. No other funds of an officially recognized student group deposited or administered through the Student Activities Fund Office may be used to purchase alcohol.

G. Student groups are not prohibited from having events off campus at which individual group members aged twenty-one or older bring or buy their own alcoholic beverages.

Students who violate the policy face mandatory alcohol education, housing sanctions (for violations arising in University Housing), and sanctions including written reprimand, restitution, counseling/referral, and/or educational/community service activities. Student groups who violate the policy face sanctions of written reprimand, restitution, mandatory educational programs or community service, and/or loss of University recognition. Behavior that violates the Code of Student Conduct, state or federal laws may also be referred to the Student Judicial System, the Emergency Evaluation and Action Committee, and/or state and federal authorities.

Equity in Athletics Disclosure Act

Information compiled under the federal Equity in Athletics Disclosure Act is available on request from the Office of the Director of Athletics.

Student Right-to-Know Act

Pursuant to the federal Student Right-to-Know Act, we report that, in 2000-2001, the completion or graduation rate for undergraduates who entered the University of North Carolina at Chapel Hill in 1995 on a full-time basis was 81.8 percent.

Minority Presence Grant Program — General Study

The University will continue to fund the Minority Presence Grant Program - General Program, Part I and Part II. The University will allocate this money to historically White and historically Black institutions to aid them in recruiting financially needy North Carolina students who would be minority presence students at the respective institutions by enabling the institutions to offer relatively more aid for minority presence students in the form of grants rather than loans. General Program Part I includes funds for minority presence grants for students attending the North Carolina Central University School of Law. General Program Part II consists of grant funds for Native Americans, Hispanics, and Asians.

Minority Presence Grant Program — for Doctoral Study

The Minority Presence Grant program for Doctoral Study, Law, and Veterinary Medicine provides stipends of up to $4,000 for the academic year, with an option of $500 in additional support for study in the summer session, for Black residents in North Carolina who are selected to participate. Recipients must be full-time students pursuing doctoral degrees, law degrees, or degrees in veterinary medicine at East Carolina University, North Carolina State University, The University of North Carolina at Chapel Hill, The University of North Carolina at Greensboro, or The University of North Carolina at Charlotte.
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