The Graduate School
Announcements for the Session 1998-1999

RECORD OF

THE UNIVERSITY

OF NORTH CAROLINA AT CHAPEL HILL

July 1998 Number 1115
Number 1115

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The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599
Record of the University of North Carolina at Chapel Hill
1998-1999

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Statement on Equal Educational Opportunity
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 race, color, national origin, religion, sex, age, or disability. Any complaints alleging failure of this institution to follow this policy should be brought to the attention of the Assistant to the Chancellor. The University of North Carolina at Chapel Hill actively seeks to promote integration by recruiting and enrolling a larger number of African American, Native American, and other minority students.

Policy on Nondiscrimination
It is the policy of The University of North Carolina at Chapel Hill that educational and employment decisions be based on individuals' abilities and qualifications and not on factors or personal characteristics that have no connection to academic abilities or job performance. Among the traditional irrelevant factors are race, sex, religion, and national origin. 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. This policy prohibiting discrimination on the basis of sexual orientation does not apply to the University's relationship with outside organizations, including the federal government, the military, ROTC, and private employers.
The University of North Carolina at Chapel Hill
Mission Statement

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 expand the body of knowledge; to teach students at all levels in an environment of research, free inquiry, and personal responsibility; to improve the condition of human life through service and publication; and to enrich our culture.

To fulfill this mission, the University must acquire, discover, preserve, synthesize, and transmit knowledge; provide high-quality undergraduate instruction to students within a community engaged in original inquiry and creative expression while committed to intellectual freedom, personal integrity and justice, and values that foster enlightened leadership for the state and the nation; 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 for 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.

April 25, 1996 as adopted by the Board of Trustees, The University of North Carolina at Chapel Hill
Calendar of Events 1998-1999

FIRST SUMMER SESSION 1998

MARCH
Summer advising begins according to school policy. (See Advising Sessions in the Summer School Catalog.)

Telephone Registration Period I (TR I) begins according to CAROLINE Telephone Registration Schedule. (See Summer School Catalog.)

Billing dates. (See Tuition and Fees in the Summer School Catalog.)

APRIL
TR I closes at 5 p.m.

MAY
Tuition and Fees due for all students. (Students who register in TR I must pay or defer tuition and fees by this date or their schedule will be cancelled and all their courses dropped.)

Pre-registered class rolls distributed.

Telephone Registration Period II (TR II) begins for all students.

Residence halls open at 9 a.m.

Classes begin for all students. Late registration begins. $10 fee charged for late registration.
Last day to add a course and end of late registration. No registration or course adds accepted through Telephone Registration after 5 p.m.

Holiday, Memorial Day.

Last day to reduce course load for credit on student's financial account. (Dropping only course requires official withdrawal.)

TR II closes at 5 p.m.

JUNE
Last day for undergraduate students to drop courses.

Verification class rolls distributed.

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

Last day for graduate students to file with their dean's office (Graduate School) for degree to be awarded in August.

SECOND SUMMER SESSION 1998

MARCH
Summer advising begins according to school policy. (See Advising Sessions in the Summer School Catalog.)

Telephone Registration Period I (TR I) begins according to CAROLINE Telephone Registration Schedule (See Summer School Catalog.)

MAY
Billing dates. (see Tuition and Fees in the Summer School Catalog.)

TR I closes at 5 p.m.

JUNE
Pre-registered class rolls distributed.

Telephone Registration Period II (TR II) for all students.

Residence halls open at noon.

JULY
Classes begin for all students. Late registration begins. $10 fee charged for late registration.

Last day to add a course and end of late registration. No registration or course adds accepted through Telephone Registration after 5 p.m.

Written examinations for August master's degree candidates may not be taken after this date.
Tuition and Fees due for all students. (Students who register in TR I must pay or defer tuition and fees by this date or their schedule will be cancelled and all their courses dropped.)

Last day for undergraduates to file with their dean's office for degree to be awarded in August.

Holiday, July Fourth.

TR II closes at 5 p.m.

Last day to reduce course load for credit on student's financial account. (Dropping only course requires official withdrawal.)

Last day for undergraduate students to drop courses.

Verification class rolls distributed.

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

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

Last day for graduate students to drop courses.

Last day to withdraw without any tuition credit.

AUGUST
- Second Summer Session classes end.
- Second Summer Session examinations begin.
- Second Summer Session examinations end.

Degree award date recorded for Second Summer Session degree recipients.

FALL SEMESTER, 1988

MARCH
- Telephone Registration Period (TR I) begins according to Telephone Registration Schedule (See Directory of Classes.)
- Fall advising begins according to school policy. (See Advising Sessions in the Directory of Classes.)

JUNE
- Billing dates. (See Tuition and Fees in the Directory of Classes.)

JULY
- TR I closes at 5 p.m.
OCTOBER
Verification class rolls distributed. 2, Friday
Freshmen midterm progress reports due. 6, Tuesday
Last day for both graduates and undergraduates to file with their dean's office for degree to be awarded in December. 9, Friday
University Day. 12, Monday
FALL RECESS. Instruction ends at 5 p.m. 14, Wednesday
Instruction resumes at 8 a.m. 19, Monday
Last day to withdraw for credit on student’s financial account. (Prorated over nine weeks.) 20, Tuesday
Written examinations for December master's candidates may not be taken after this date. 31, Saturday

NOVEMBER
Last day for graduate students to drop courses. 23, Monday
Thanksgiving Recess. Instruction ends at 1 p.m. 25, Wednesday
Instruction resumes at 8 a.m. 30, Monday

DECEMBER
Final signed copies of doctoral dissertations and master's theses for December graduation candidates must be filed in the Graduate School. 4, Friday
Fall semester classes end. 7, Monday
Reading day. 8, Tuesday
Fall semester examinations begin. 9, Wednesday
Reading day. 12, Saturday
Fall semester examinations continue. 14, Monday - 16, Wednesday
Mid-year commencement. 20, Sunday
Degree award date recorded for fall degree recipients. 31, Thursday

The fall semester 1998 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.

Days of Instruction
15-Mondays 16-Tuesdays
16-Wednesdays 14-Thursdays
14-Fridays
45 30
(2,250 minutes) (2,250 minutes)

SPRING SEMESTER, 1999
OCTOBER, 1998
Spring advising begins according to school policy. 8, Thursday
(See Advising Sessions in the Directory of Classes.)
Telephone Registration Period (TR 1) begins according to Telephone Registration Schedule. (See Directory of Classes.) 17, Saturday

NOVEMBER
Billing dates. (See Tuition and fees in the Directory of Classes.) 4, Wednesday - 17, Tuesday
TR I closes at 5 p.m. 17, Tuesday

DECEMBER
Tuition and fees due for all students. (Students who register in TR I must pay or defer tuition and fees by this date or their schedule will be cancelled and all their courses dropped.) 9, Wednesday
Pre-registered class rolls distributed. 17, Thursday
Telephone Registration Period II (TR II) begins. 30, Wednesday

JANUARY 1999
Residence halls open at 9 a.m. 3, Sunday
Orientation/academic counseling. 4, Monday - 5, Tuesday
Classes begin for all students. Late registration begins. $10 fee charged for late registration. 6, Wednesday
Last day to add a course and end of late registration. No registration or course adds accepted through Telephone Registration after 5 p.m. 12, Tuesday
Holiday, Martin Luther King Jr. Day. (Telephone Registration closed.) 18, Monday
Last day to reduce course load for credit on a student's financial account. (Dropping only course requires official withdrawal.) 20, Wednesday
TR II closes at 5 p.m. 20, Wednesday
Preliminary class rolls distributed. 21, Thursday

FEBRUARY
Last day for undergraduate students to file an application with their dean's office for degree to be awarded in May. 22, Friday
Freshmen early warning rolls distributed. 22, Friday

FEBRUARY
Freshmen early warning rolls due to General College. 6, Friday
Last day for graduate students to file with their dean’s office (Graduate School) for degree to be awarded in May. 12, Friday
Last day for undergraduate students to drop courses.  17, Wednesday

Last day for graduate and undergraduate students to submit Pass/Fail declarations.  17, Wednesday

Verification class rolls distributed.  22, Monday

MARCH

SPRING RECESS. Instruction ends at 5 p.m.  5, Friday

Instruction resumes at 8 a.m.  15, Monday

Last day to withdraw for credit on student’s financial account. (Prorated over nine weeks plus $25.00.)  10, Wednesday

Written examinations for May master’s candidates may not be taken after this date.  13, Saturday

APRIL

Holiday, Good Friday.  2, Friday

Last day for graduate students to drop courses.  15, Thursday

Final signed copies of doctoral dissertations and master’s theses for candidates for May graduation must be filed in the Graduate School.  21, Wednesday

Spring semester classes end.  29, Thursday

Reading day.  30, Friday

MAY

Spring semester examinations begin.  1, Saturday - 4, Tuesday

Reading day.  5, Wednesday

Spring semester examinations continue.  6, Thursday - 8, Saturday

Spring commencement.  16, Sunday

Degree award date recorded for spring degree recipients.  16, Sunday

The spring semester 1999 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.

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THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

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Linda Lacey, Ph.D., M.R.P., Associate Dean for Recruitment and Special Projects
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Diane Davis, Manager, Admissions Office
Rhonda Mitchell, Manager, Enrolled Students Office

THE ADMINISTRATIVE BOARD OF THE GRADUATE SCHOOL OF THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

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STUDENT REPRESENTATIVE
Michael Holland, M.S., Chemistry

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The Chancellor and the Provost also are ex officio members of the Board.
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 doctoral-level programs and eighty-one master's-level programs currently active in the Graduate School.

This catalog provides basic information about these programs. It includes our admission standards and requirements, tuition and other costs, sources of financial aid including fellowships, graduate degree requirements, 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 and/or special skills 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 (seventeenth in the nation, one of the largest in the Southeast), and other outstanding facilities, the University has a warm and collegial spirit that is conducive to personal growth and scholarship.

As you consider your future, we hope you will consider the University of North Carolina at Chapel for your graduate program. If you have an opportunity to visit the campus, we would be pleased to meet with you at our offices in Bynum Hall where we can tell you more about Carolina and our graduate programs.

The Graduate School
**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 and the Master of Accounting degrees, all master's degrees offered by the University and the degrees of Doctor of Philosophy, Doctor of Education, 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 nineteen members of the faculty who represent the following six divisions:

**The Division of the Humanities and Fine Arts**
- Art
- Art History
- Classics
- Communication Studies
- Comparative Literature
- Dramatic Art

**The Division of Basic and Applied Sciences**
- English
- Folklore
- Germanic Languages
- Linguistics
- Music
- Philosophy
- Religious Studies
- Romance Languages
- Slavic Languages

**The Division of Social Sciences**
- Anthropology
- City and Regional Planning
- Economics
- Geography
- History
- Leisure Studies and Recreation Administration
- Political Science
- Psychology
- Public Administration
- Public Policy Analysis
- Sociology

**The Division of Professional Schools—Academic Affairs**
- Kenan-Flagler Business School
- School of Education
- School of Information and Library Science
- School of Journalism and Mass Communication
- School of Social Work

**The Division of Health Affairs—Biomedical**
- School of Dentistry
- Dental Hygiene Education
- Endodontics
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 write to the dean of the Summer School, The University of North Carolina at Chapel Hill, CB# 3340, 134 E. Franklin St., 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 and use of its 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, one should consult the Calendar of Events printed at the front of this catalog.
Admission, Orientation, Funding Opportunities, and Financial Aid

DEGREES OFFERED

Anthropology — M.A., Ph.D.
Applied and Materials Sciences — M.S., Ph.D.
Art — M.F.A., M.A., Ph.D. (Art History)
Biochemistry and Biophysics — M.S., Ph.D.
Biology — M.A., M.S., Ph.D.
Biomedical Engineering — M.S., Ph.D.
Business Administration — Ph.D.
Cell Biology and Anatomy — M.S., Ph.D.
Chemistry -M.A., M.S., Ph.D.
City and Regional Planning — Master of Regional Planning, 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.
Dental Health Education — M.S.
Dentistry — M.S., Oral Biology — Ph.D.
Dramatic Art — M.F.A.
Ecology — M.A., M.S., Ph.D.
Economics — M.S., Ph.D.
English — M.A., Ph.D.
Folklore — M.A.
Genetics and Molecular Biology — M.S., Ph.D.
Geography — M.A., Ph.D.
Geology — M.A., M.S., Ph.D.
Germanic Languages — M.A., Ph.D.
History — M.A., Ph.D.
Human Movement Science — M.S.
Information and Library Science — M.S. in Library Science, M.S. in Information Science, Ph.D.
Interdisciplinary Biomedical Sciences — Ph.D.
Journalism and Mass Communication — M.A. or Ph.D. in Mass Communication
Leisure Studies and Recreation Administration — M.S. in Recreation Administration
Linguistics — M.A., Ph.D.
Marine Sciences — M.S., Ph.D.
Mathematics — M.A., M.S., Ph.D.
Microbiology and Immunology — M.S., Ph.D.
Music — M.A., Ph.D.
Neurobiology — Ph.D.
Nursing — M.S. in Nursing, Ph.D.
Occupational Therapy — M.S.
Operations Research — M.S., Ph.D.
Pathology — M.S., Ph.D.
Pharmacology — M.S., Ph.D.
Pharmacy — M.S., Ph.D.
Philosophy — M.A., Ph.D.
Physical Education, Exercise, and Sport Science — M.A.
Physical Therapy — M.P.T.
Physics and Astronomy — M.S., Ph.D.
Physiology — Ph.D.
Political Science — M.A., Ph.D.
Psychology — Ph.D.
Public Administration — M.A.
Public Health — M.P.H.
Biostatistics — M.S., Dr.P.H., Ph.D., M.P.H.
Environmental Sciences and Engineering — M.S., M.S.E.E., M.S.P.H., Ph.D., M.P.H.
Epidemiology — M.S.P.H., Dr.P.H., Ph.D., M.P.H.
Health Behavior and Health Education — M.S.P.H., Dr.P.H., Ph.D., M.P.H.
Health Policy and Administration — M.H.A., M.S.P.H., Dr.P.H., Ph.D., M.P.H.
Maternal and Child Health — M.S.P.H., Dr.P.H., M.P.H.
Nutrition — Dr.P.H., Ph.D., M.P.H.
Public Health Leadership — M.P.H.
Public Health Nursing — M.S.
Public Policy Analysis — Ph.D.
Rehabilitation Psychology and Counseling — M.S.
Religious Studies — M.A., Ph.D.
Romance Languages — M.A., Ph.D.
Slavic Languages — M.A., Ph.D.
Social Work — Master of Social Work, Ph.D.
Sociology — M.A., Ph.D.
Speech and Hearing Sciences — M.S.
Statistics — M.S., Ph.D.
Toxicology — M.S., Ph.D.

GENERAL ADMISSIONS INFORMATION

Admission

Application for admission should be made via the World Wide Web at gradschool.unc.edu or on forms provided by the Graduate School. Inquiries concerning admission and requests for application forms should be directed to the WWW address above or to:

The Graduate School
The University of North Carolina at Chapel Hill
CB# 4010, 200 Bynum Hall
Chapel Hill, NC 27599-4010
(919) 966-2611
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 currently are no residency quotas for admissions. Applicants must hold an undergraduate degree from an accredited 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 minimal requirement, however, does not ensure admission.

Application

A separate application and fee must be submitted for each graduate program. The preferred means of receiving an application is via the WWW online application for admission at gradschool.unc.edu.

Application Deadline

Fall applications are due January 1 for applicants who wish to be considered for Graduate School funding. Individual programs may elect to continue receiving applications past this date. These programs will establish their own application deadline and applicants may be eligible for program-based funding. Please contact the program to which you are applying for specific information.

Students seeking admission for the spring semester should file applications no later than October 15. International applicants should apply early in order to allow sufficient time to process financial and visa documents.

Most programs do not admit students for the spring semester. Applicants should check with their intended program before applying for spring semester admission.

Application Fee

Applications must be accompanied by a nonrefundable $55 fee for each program. Checks or money orders (no cash) should be made payable to The University of North Carolina at Chapel Hill. International applicants should send an international money order. Applications arriving without the required fee will remain on file, unprocessed. Applicants who ask others to submit payment for them should ensure that their own names are clearly noted as the intended applicants.

Application Fee Waiver

Fee waiver requests are considered for United States citizens who (1) are currently enrolled in a degree program with no breaks in enrollment from the point of entry in the undergraduate program, (2) are currently receiving financial 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 must be submitted certifying items 1, 2, and 3 above. Submission of anything other than the certification described here is unacceptable. The Graduate School is unable to waive the application fee for international applicants.

Application Status

Notification of application receipt will occur once the fee has been paid and the application has been processed. Application receipt can also be confirmed via the Web at gradschool.unc.edu. Since much of the required supporting material for an application is sent directly to the intended program, applicants are encouraged to direct all inquiries concerning receipt of those materials to that office.

Decision Notification

Although a program may notify an applicant of its recommendation to the Graduate School, notification of the official decision regarding the application must 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 fall offers of admission. Every effort will be made to give sufficient notice regarding applications prior to this deadline. Where an early decision is not possible, applicants can expect final notification no less than two months before the opening 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 offering 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. Applicants should consult with their chosen programs regarding the appropriate degree intent to indicate on their applications.

Provisional Admission

The Graduate School of the University of North Carolina at Chapel Hill 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. Applicants should verify the appropriate term of entry for their applications with their intended programs. Admission is only valid for the semester stated in the admission letter. Policies regarding deferment of admission vary by program. The Graduate School will, upon the program's recommendation, defer admission once without requiring reapplication.

Time-to-Degree Limitations

A graduate student working for a master's degree has five calendar 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 six semester hours of graduate credit, or 20% of total hours required for programs with a credit hour requirement over 30, from another accredited institution, or from courses taken at this institution prior to admission to the Graduate School (e.g., Continuing Studies, Summer School, etc.), in partial fulfillment of the requirements for a master’s degree. Upon recommendation of the major program and approval of the Graduate School, a doctoral student may transfer 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 the student will be held accountable for the contents at the time of the doctoral oral exam. 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. Applicants should direct inquiries regarding the transfer of graduate credit to the programs to which they intend to apply.

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 an intended program.

Letters of Recommendation

Three letters of recommendation from persons qualified to evaluate the applicant’s academic and professional qualifications are required. Applicants should request recommendations from individuals who are familiar with their academic achievement and potential. For those who have been out of school for a number of years and who are unable to contact former professors, letters from other individuals who can address their achievement and potential will be accepted. Applicants should carefully complete Section I of the enclosed letter of recommendation form before giving it to their recommenders. Recommenders should return their letters to applicants in a sealed envelope, with a signature over the flap; applicants should then submit the letters with the application materials directly to the programs to which they are applying. Although it is extremely helpful if these letters are sent with the program material, some recommenders prefer to send letters separately. Applicants should inform them of the January 1 application deadline so that they can submit the recommendation before that date. There is a “waiver of right to inspect” statement on these forms; applicants may, or may not, elect to sign the waiver. If they elect to sign the waiver the contents of the reference will not be released to them.

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 bearing 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 to receive official transcripts with all applications. However, if an applicant’s registrar will only send transcripts directly to the Graduate School, then the school will process them separately. Applicants should not send transcripts directly to their intended programs. To prevent delays in the review process, applicants should request transcripts before mid-year grades are posted. However, they are still responsible for assuring that the Graduate School receives a final transcript, showing award of the degree. Transcripts submitted to the Graduate School become part of applicants’ permanent records and cannot be “re-released” to other institutions, to employers, or to applicants themselves.

Standardized Test Scores (GRE, GMAT, TOEFL, etc.)

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. (The Program Information section contains further details.) 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 trust territories), must also submit an acceptable official TOEFL score (550 with a minimum of 50 in each section; some programs require a higher score and the Graduate School honors that requirement).

The University’s accreditation requires that official reports (reported directly from ETS) of all required standardized test scores be submitted as part of an application. While the Graduate School is happy to receive photocopies of score reports 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. GRE/GMAT scores more than five years old and TOEFL scores more than two years old are not accepted since they cannot be officially reported. 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. (Information on computerized testing can be obtained at 1-800-967-1100.) Four to six weeks are required for test scores to reach the Graduate School; applicants should take the exam no later than October for fall admission consideration. Those who did not specify UNC-Chapel Hill Graduate School as a score recipient at the time of taking the
exam should contact Educational Testing Service promptly and ask that the scores be sent 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. Applicants should check with their intended programs regarding these requirements before submitting their applications. Applications 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. Contact with the intended program is essential before submitting an application since the application process itself is expensive.

All applicants must send payment for the application fee ($55 for each program) in United States funds. This fee cannot be waived. Applicants who ask others to pay the application fee for them should request that when the check or money order is being submitted, their own names should be given as the intended applicants. Applications arriving without the required fee will remain on file, unprocessed, pending receipt of the fee. Notification of application receipt 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; some programs require a higher score and the Graduate School honors that requirement. TOEFL scores are reportable for a period of two years from date of the exam; scores more than two years old will not be reported by ETS, and thus cannot be considered by the Graduate School. The school will keep TOEFL scores on file for only one year. Applicants registering for the test should indicate the University of North Carolina at Chapel Hill Graduate School (Institution #5816) as a score recipient. Those who did not specify at the time of taking the TOEFL that the UNC-Chapel Hill Graduate School was to receive their scores must promptly ask Educational Testing Service (ETS) to send the scores to the Graduate School (Institution #5816). Their address is TOEFL, CN6151, Princeton, NJ 08541-6151. While the Graduate School will be happy to receive photocopies of score reports for informal evaluation, admission cannot be offered until the official report arrives.

**Financial Certificate**

In order to meet United States Immigration requirements for entry into the country, proof of sufficient financial resources to cover educational and living expenses for the duration of the program must be in place before visa documents can be issued. A completed Financial Certificate (form enclosed) outlining available financial support, along with original evidence to support the amounts reflected (bank statements, scholarship letters, etc.), must be submitted along with the application for admission. 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 visa, United States immigration, or financial certificate matters can be obtained from the UNC-Chapel Hill International Center at 919-962-5661 or via the Web at www.unc.edu/depts/interctr.

**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 and a reference guide to campus and Chapel Hill community resources. Upon arrival, new students receive a copy of a Graduate School folder with The Graduate School Handbook, a brochure entitled Responsible Conduct of Research, 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.

During the first week of classes, the Graduate School hosts an open house in Bynum Hall to help students continue to get to know the deans and staff who will be important to them during the various stages of their graduate career. In addition, the Graduate School is open year-round to answer questions and help students find the resources they need to make the most of their Carolina experience.

**FUNDING OPPORTUNITIES**

UNC-Chapel Hill provides financial support for graduate students in various ways. Each year, approximately two thousand students receive teaching, research, or graduate assistantships. In addition, nearly seven hundred students receive fellowships and traineeships from university, private, and government sources,
and about fifty work-study assistantships are offered to students with financial need. Loan funds also are available.

Awards are made from 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 an award, applicants complete an application for admission, which is due in the Graduate School no later than January 1. To receive financial assistance, students must continue to be enrolled, making satisfactory progress towards their degree.

**University Competitive, Merit-Based Awards**

A number of merit-based awards are available through the Graduate School. Prospective students cannot apply for these awards directly, but may indicate when applying that they wish to be considered for these awards. 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 in early March. The following fellowships and assistantships are competitively awarded from the Graduate School:

**The Carolina Society of Fellows**

The Carolina Society of Fellows is a new, highly competitive fellowship created through the generosity of private donors, most significantly Dr. Thomas and Mrs. Caroline Royster. The Carolina Society of Fellows was initiated in 1996 with nine fellows, each of whom received a stipend of $15,000 plus health insurance. This support enabled them to devote themselves full-time to completing their doctoral dissertations. The fellows, along with three alternates, also received $1,000 in travel funds to attend academic conferences and share their research findings with others.

An important part of the society has been strong mentoring by senior faculty of the University, the senior fellows of the society. Through monthly interdisciplinary forums, the fellows are nurtured in their professional development. Intellectual discussions among faculty and the fellows—from the vantage point of a dozen different disciplinary perspectives—stimulate learning with great breadth and insight. This opportunity provides excellent preparation for the fellows as they begin their professional careers.

Beginning in 1998, the Carolina Society of Fellows will award five-year fellowships to about eight entering doctoral students. Each fellow will receive a $15,000 stipend, tuition and fees, and health insurance each year. The first and last years will be nonservice awards, but fellows may perform teaching and research activities for their departments in the intervening years. In the last year of their fellowship, they will receive travel funds of $1,000. Throughout their fellowship, the students meet together with senior faculty, and engage in interdisciplinary forums and discussions designed especially for them. This strong mentoring and guidance by senior faculty is an important aspect of the program.

**Privately Endowed University Fellowships**

The Graduate School offers named fellowships that carry an academic year stipend of $14,000 plus tuition and fees. The award period for a named fellowship is three years, and the doctoral student must use the fellowship within five years. Candidates for the master's degree, in those academic departments for which the master's degree is required prior to formal admission to doctoral study, are eligible for nomination, provided that they clearly indicate their intent to continue in the doctoral program at the time they apply to the Graduate School. These endowed fellowships include:

- The Joseph E. Pogue Fellowships,
- The William R. Kenan Jr. Fellowships
- The William N. Reynolds Fellowships,
- The Mrs. Victor (Edna Angle) Humphreys Graduate Fellowship, and
- The William A. Whitaker Fellowships.

**University Merit Assistantships**

University merit assistantships are one-year awards of $12,000 for entering doctoral students and $9,000 for entering master's students. Out-of-state students may also be eligible to pay tuition at the reduced in-state rate. Students awarded merit assistantships assist with teaching or research related activities, not to exceed twenty hours per week, within their department.

**Minority Presence Grant Program**

The University of North Carolina offers the Minority Presence Grant Program for Doctoral Study as one mechanism to increase the number of minorities engaged in doctoral study within the UNC system. Recipients must be African American or Native American North Carolina residents pursuing a doctoral degree. Awards are $12,000 per academic year, plus tuition, fees, and health insurance. Multiple year awards may be granted. (For additional information, see appendix.)

**Interdisciplinary Special Awards**

**McColl Fellowship in Southern Studies**

This specially endowed fellowship, made possible through the generous support of Hugh McColl, is designed to recruit exceptional doctoral students interested in southern studies. This fellowship, which is part of the Carolina Society of Fellows, is administered through the Center for the Study of the South, and provides a $15,000 stipend for three years. Interested students may apply for this interdisciplinary fellowship through their department. Inquiries regarding this opportunity may be directed to the Center for the Study of the South.

**Weiss Urban Livability Program and Awards**

A unique opportunity for advanced study within an interdisciplinary, trans-departmental program is provided through the Weiss Urban Livability Program (ULP). The ULP is the vision
of Drs. Charles and Shirley Weiss, who have provided both intellectual leadership and generous financial support for this program since 1992. The ULP sponsors a range of integral academic activities including an annual seminar on a topic related to urban livability, guest lecturers, scholars in residence, and support for entering graduate students.

Students receive a stipend of $3,000, which usually is supplemented by a department award, and they are designated fellows within the Weiss Urban Livability Program. As fellows, they 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. Interested students may apply for this interdisciplinary award through their department. Inquiries regarding this opportunity may be directed to the Graduate School.

**Departmental Awards**

**Teaching and Research Assistantships, Merit Awards**

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.

**Privately Endowed Departmental Fellowships**

Departments also may provide fellowships and scholarship awards funded by private endowments. Eligibility criteria and selection processes vary. Applicants should discuss these potential opportunities with their prospective departments. Several departments offer fellowships funded from private sources. Examples include:

- The W. C. Coker and the Mrs. W. C. Coker Fellowships in Botany through the Department of Biology;
- The Samuel Kress Fellowship and the Emily Pollard Fellowship in the Department of Art;
- The Kent James Brown Fellowships in the Department of Germanic Languages;
- The Waddell Fellowships in the Department of History; and

**The Board of Governors’ Science and Technology Fellowships**

The Board of Governors of the University of North Carolina system sponsors fellowships in science and technology to increase the number of students in these disciplines. A stipend of $9,000, tuition, fees, and health insurance is provided for three years. This award may also be supplemented by the student's department. These three-year nonservice awards are made annually to entering doctoral students in the following departments: Biomedical Engineering, Chemistry, Computer Science, Environmental Sciences and Engineering, and Physics and Astronomy.

**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.

**Dissertation Support for Continuing Students**

These awards support doctoral students who are engaged in research and writing toward the completion of their dissertations. The Off-Campus Dissertation Award assists students conducting research away from the Chapel Hill campus. A stipend of $6,000, and payment of tuition, fees, and health insurance is provided for one academic semester. The On-Campus Dissertation Award supports students in the final phase of their doctoral dissertations. Students receive a stipend of $6,000 for one academic semester, or $12,000 for one academic year, plus tuition, fees, and health insurance.

A limited number of fellowships are also available for doctoral dissertation research in specific countries: the Werner P. Friderich Fellowship in the Humanities for study in Switzerland, and the Georges Lurcy Fellowship for study in France. Stipends vary.

**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 Office of Research Services through the GrantSource Service, which includes information from nearly ten thousand documents available from major funding sources. The University assists students in making application 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. Examples of major external funding opportunities include:

- **National Science Foundation—NSF Graduate Research Fellowship Program.** Application materials are available from NSF Graduate Research Fellowship Program, Oak Ridge Associated Universities, P.O. Box 3010, Oak Ridge, TN 37831-3010; or via Internet mail: nsfgrfp@orau.gov.
Howard Hughes Medical Institute — Predoctoral Fellowships in Biological Sciences. Application materials are available from Hughes Predoctoral Fellowships, The Fellowship Office, National Research Council, 2101 Constitution Avenue, NW, Washington, DC 20418.

Ford Foundation Predoctoral and Dissertation Fellowships for Minorities — Application materials are available from The Fellowship Office, National Research Council, 2101 Constitution Avenue, Washington, DC 20418.

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 obtained by accessing the following World Wide Web sites: (1) www.unc.edu, and (2) www.groucho.admin.unc.edu.

FINANCIAL AID

Graduate students in need of financial aid to meet the costs of attending the University should apply to the Office of Scholarships and Student Aid. Although assistance to graduate students is limited, financial support may be available from federal loan programs and from the federal work-study program, either hourly paid campus jobs or teaching/research assistantships.

To be eligible for financial aid from funds 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. In addition, the student must establish by information reported on the application form that the student's financial resources are not sufficient to meet the costs of attending the University.

Determination of eligibility for financial aid is based on a methodology established by the United States Congress for federal student aid programs. Since the majority of funds for graduate students are from federal programs, the standard analysis is used to measure eligibility for all funds available through the Office of Scholarships and Student Aid. The methodology, which is used nationally by colleges and universities, determines the amount that the student can reasonably be expected to contribute toward educational costs. Factors considered include the expected income of the student, based on the amount earned in the preceding calendar year; the assets available to the student; and any awards that the student may have received from other sources. Aid eligibility is the difference between costs of attending the University (using standard budgets developed by the Office of Scholarships and Student Aid) and the amount the student is expected to pay toward costs. Assistance from lower-interest loans and from the federal work-study program may not exceed the student's aid eligibility. Loans from higher-interest programs are available to students who do not have aid eligibility or to supplement other aid, but they may not exceed the difference between the standard budget and other aid awarded to the student.

Students who are awarded need-based financial aid will receive grant assistance to meet up to the first $400 of need. Income for these grants is derived from a tuition enhancement charge adopted in 1996 to provide support for University libraries, faculty salaries, and financial assistance to needy students.

To apply for the tuition grants, for the federal loan programs, and for federal work-study assistance, a graduate student must complete the Free Application for Federal Student Aid (FAFSA). The form may be obtained from most college financial aid offices and in person at the Office of Scholarships and Student Aid. In completing the FAFSA, a student must list UNC-Chapel Hill, code number 002974, as one of the schools in Section H. The form should be sent by the student to the processing agency identified in the instructions. Information and an analysis of the student's eligibility for funds will be sent by that agency to the Office of Scholarships and Student Aid.

The preference deadline for submitting the FAFSA for both new and returning students is March 1. The form should be mailed in time to be received by the processing agency by March 1. A student should not wait for admission to a graduate program before applying for aid. An applicant who submits the form by March 1 and completes the file promptly can expect to receive notice of an award decision by July 1. Students who apply after March 1 cannot be assured that award notifications will be completed prior to the beginning of school.

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 copy of the federal income tax return for the student and/or spouse, verification of family size, and updated information on the student's expected income for the application year may be requested. The materials should be submitted promptly to avoid delay in the application process.

If a student has attended other colleges and universities, information must be provided to UNC-Chapel Hill about financial aid received by the student at previous schools and about whether the student is in default on a federal loan or owes a refund to a federal grant. For most applicants, this information is available to UNC-Chapel Hill through a national database. However, if the information is incomplete, the Office of Scholarships and Student Aid will notify the student that a Financial Aid Transcript (FAT) must be completed by the financial aid office at each previous school. If the FAT is needed, a copy of the form will be sent to the student to be forwarded to previous schools.

The Office of Scholarships and Student Aid requests information directly from an applicant's school or department about graduate aid that may have been awarded. The information is needed to determine a student's eligibility for financial
assistance. The applicant's file will not be complete until the requested information has been received from the school or department.

Additional information about financial aid procedures and programs can be obtained from the Office of Scholarships and Student Aid, 300 Vance Hall, P.O. Box 1080, Chapel Hill, NC 27514. The telephone number is (919) 962–8396; www.adp.unc.edu/sis/finaid/finaid.html. The office is open from 8:00 a.m. until 5:00 p.m., Monday through Friday.
Tuition and Fees, Student Health, Disability Services, Campus Safety, Student Housing, and Dining Services

Tuition and Fees

Tuition and fees are assessed on a semester basis and are due prior to registration. Payments may be made in advance, in person, or by mail. MasterCard and VISA are accepted. To avoid the inconvenience of standing in line, students are asked to mail payment to: University Cashier, CB# 1400, 103 Bynum Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-1400. Checks should be made payable to The University of North Carolina at Chapel Hill. The student's ID number should show on the face of the check. Accounts not paid in full by the due date are subject to cancellation of registration.

The estimated total expenses for a full-time graduate student for an academic year (two semesters) are as follows:

Estimated Student Budgets: 1998-1999

<table>
<thead>
<tr>
<th></th>
<th>NC Resident</th>
<th>Nonresident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and fees</td>
<td>$2,215</td>
<td>$11,200</td>
</tr>
<tr>
<td>Books and supplies</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>Food and housing</td>
<td>4,760</td>
<td>4,760</td>
</tr>
<tr>
<td>Personal expenses/transportation</td>
<td>1,657</td>
<td>2,157</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$9,232</strong></td>
<td><strong>$18,717</strong></td>
</tr>
</tbody>
</table>

All new graduate students are required to pay an orientation fee of $15 and an ID card fee of $5 for their initial semester.

Each student is responsible for paying his or her University bills. If someone other than the student is responsible for payment, the University Cashier should be notified in ample time so that a bill may be sent to the proper person or agency.

Students expecting to receive financial aid, scholarship funds, fellowship funds, or payment for service appointments should bring with them sufficient funds (cash or travelers checks) to take care of living expenses for approximately fifteen days. This should provide enough time for appropriate funds to be made available.

The last day to reduce a course load for credit on student financial accounts is two weeks from the first day of classes for each semester. A student who is registered for only one course and decides to drop that course must go to his or her dean’s office to complete a withdrawal form.

Withdrawals are prorated over a period of nine weeks at a rate of one-tenth of the semester’s bill after deduction of a $25 administrative charge. The last date for credit on a student’s financial accounts for withdrawal is nine weeks after registration.

A nonrefundable application fee of $55 must be submitted with the application for admission to the Graduate School. Applicants who have been offered admission for the fall or spring semester reserve their place by paying a $50 nonrefundable enrollment deposit, which is credited toward tuition for the semester for which they are admitted. Such deposits are not required for the summer session. Advance deposits are not refundable if applicants fail to enroll.

Following is the schedule of tuition and fees for the fall and spring semesters, 1998-1999. This schedule is subject to change without notice.

Tuition and Fees by Hours (Per Semester)

<table>
<thead>
<tr>
<th>Hours</th>
<th>NC Resident</th>
<th>Nonresident</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Hours (thesis only-no credit)</td>
<td>$ 483.96</td>
<td>$1,244.96</td>
</tr>
<tr>
<td>0-2.9 Hours (credit hours and thesis)</td>
<td>483.96</td>
<td>1,606.96</td>
</tr>
<tr>
<td>3-5.9 Hours (credit hours and thesis)</td>
<td>691.46</td>
<td>2,938.46</td>
</tr>
<tr>
<td>6-8.9 Hours (credit hours and thesis)</td>
<td>899.46</td>
<td>4,268.46</td>
</tr>
<tr>
<td>9.0 Hours and above</td>
<td>1,101.46</td>
<td>5,600.46</td>
</tr>
</tbody>
</table>

Resident Status for Tuition Payment

As a state-supported institution, tuition rates for students who are North Carolina residents are lower than those for out-of-state students. The enclosed one-page Residence Form must be completed and submitted by every applicant who claims eligibility for in-state tuition rates. If additional information is required, you will be notified.

Military Tuition Benefit: Under North Carolina Law (G.S. 116-143.3) certain members of the armed services and their dependent relatives may be eligible to pay the in-state tuition rate whether or not they qualify as residents for tuition purposes. For details contact the Graduate School at 919-962-6327.

The following is a quick reference for graduate students interested in applying for resident tuition status at the University of North Carolina at Chapel Hill. For more information about the issues discussed here, consult A Manual to Assist the Public Higher Education Institution of North Carolina in the Matter of Student Residence Classification for Tuition Purposes. The Manual is available for review at the libraries and admissions offices on the fifteen campuses that are part of the University of North Carolina System, and at North Carolina community colleges. Information is also available at www.unc.edu/sis/admissions/grad/ncres.html.

Under North Carolina law, to qualify for in-state tuition for a given term, you must prove:
- that you established your domicile in North Carolina twelve months before the beginning of the term, and
- that you have maintained that domicile for at least twelve continuous months.
To prove that you established a **bona fide domicile** in North Carolina you must prove:
- that you were physically present in the state,
- with the intent to make North Carolina a permanent home indefinitely, and
- that you were not in North Carolina solely to attend college.

Because it is difficult to determine intent to make North Carolina your home, residency classifiers must evaluate the actions you have taken that may indicate "domiciliary intent." The Manual lists the following considerations which may be significant in determining this intent:

- Do you live in your parents' home? Where are/were you employed?
- Where did you register to vote? Where did you vote?
- Where have you served on jury duty? What are the sources of your financial support?
- Where have you registered/licensed a car? Where did you get your last driver's license?
- Where do you own a home or other real estate? Where do you keep your personal property?
- Where do you list personal property for taxation? Where did you file state income tax returns?
- Where do you spend your vacation time? Where did you last attend school?
- Where did you live before enrolling in an institution of higher learning?
- Where do you maintain memberships in professional associations, unions, and similar organizations!

Residency classifiers weigh the evidence furnished in your application for resident status, and the preponderance of the evidence (greater weight) must support your having established North Carolina domicile twelve months prior to the beginning of the academic term for which you seek in-state status. To begin the residency classification process you must complete and submit this short resident status application with your application for admission. If you feel your answers on this form give an inaccurate or incomplete picture of your case, please attach additional explanation. If, upon review of this form, it is not clear that you are a resident for tuition purposes, the Graduate School will send you a more comprehensive form to complete.

**STUDENT HEALTH SERVICE**

The Student Health Service (SHS), a member of the Division of Student Affairs, is located in a facility in the northeastern corner of the medical center complex and has overall responsibility for the health care of all students in the University. Students are eligible for health care in the SHS if they have paid the student health fee for the current semester or summer session. The fee covers the cost of most services provided by SHS professionals including physicians, physician extenders, physical therapists, and mental health professionals. Laboratory and X-ray studies done at the SHS require a copayment. Additional charges are incurred for hospital rooms, after-hours, drugs, miscellaneous supplies, and laboratory and X-ray studies. Spouses not enrolled in the University may receive the same services as students by verifying that they have appropriate insurance coverage and by paying the student health fee at the SHS. Charges for SHS services may vary from year to year and should be checked at any visit.

The SHS provides a comprehensive program of health care delivery, including general outpatient and inpatient medical care, a pharmacy, and specialized clinics in allergy, gynecology, orthopedics, ENT (ear, nose, and throat), and dermatology. There are charges for these specialty clinics. Preventive services include immunizations and other preventive services normally expected in any community or public health service facility. Preventive immunizations also result in charges in most instances. The Wellness Resource Center, located in the Student Recreation Center, is staffed by SHS and trained peers. Workshops, groups, and information are available on fitness, nutrition, human sexuality, contraception, relaxation, and alcohol abuse prevention.

Office hours are 9:00 a.m. to 5:00 p.m. Monday through Friday and 9:00 to 12:00 noon on Saturday. Students are seen by appointment. Refer to the telephone directory for clinic numbers. After regular office hours and on weekends, physician extenders are available for acute care with medical and psychiatric backup. In general, students should go to the SHS first. Major problems may be referred to the UNC Hospitals Emergency Room. UNC Hospitals services are not covered by the student health fee.

Because the student health fee does not cover hospitalization, surgery, and intensive care, students are strongly encouraged to have additional health insurance. The University has arranged with Blue Cross/Blue Shield to offer group health insurance coverage including major medical benefits to enrolled single and married students, their spouses, and children. For information, contact Hill, Chesson and Associates (insurance brokers), P.O. Box 3666, Chapel Hill, NC 27514; telephone (919) 967-5900; fax (919) 493-1754; email hillches@interpath.com; Web www.hillchesson.com.

North Carolina law requires all new students to document immunization records or undergo vaccination. Failure to comply results in cancellation of registration thirty days after classes begin.

**DISABILITY SERVICES**

For students who are temporarily or permanently disabled, the Department of Disability Services can provide special services and equipment to ensure accessibility to programs and facilities at UNC-Chapel Hill. Assistance with registration, note-takers, modified testing (Braille or large print, extended time, etc.), recorded text, tutors, library assistance, etc., are some
of the services offered. For additional information, contact the Disability Services office at (919) 962-7227; www.unc.edu/depts/dsa/disability.html.

**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 Special Assistant to the Chancellor at (919) 962-7771 or via the World Wide Web at www.unc.edu.

**STUDENT HOUSING**

**The Department of University Housing**

The Department of University Housing at The University of North Carolina at Chapel Hill, consistent with the academic mission of the University, endeavors to provide eligible students a supportive environment within which to live while attending the University. 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 Department of University Housing is part of the Division of Student Affairs. The director works with a professional staff that manages housing assignments, student and staff services, administrative services, maintenance and operations, student family housing, and conference services. The Training and Programming staff is composed of area directors and assistant area directors, resident assistants, desk assistants, and secretaries. Each residence area is managed by an area director, a full-time professional staff member. The area director is responsible for the operation of the residence area. This responsibility includes supervising student staff, advising student government, activity planning, counseling individuals and small groups, and fulfilling all management functions necessary for operation of the area. The assistant area director shares with the area director responsibility for the operation of a residence area. The resident assistant, a full-time graduate student or upper-level undergraduate student, serves as educator, counselor, administrator, regulator, resource, and friend for the residents of a floor or comparable living unit in the halls. The housing support staff is composed of tradespeople and custodial employees. Their responsibility is to help keep the buildings functioning properly and to clean public areas.

The major purpose of University Housing is to provide students with a living environment that will allow them to take full advantage of the educational opportunities at Carolina. In addition, the department attempts to enhance the students' development outside of their academic experience.

In order to accomplish this goal, University Housing provides many services to each resident. Staff in each building help in the transition for those new to University Housing and in the continual growth of those who choose to return. Overall, the department works to provide students with an environment that is optimal for student living and learning on our campus.

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 for 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.

The University of North Carolina at Chapel Hill is committed to equal opportunity for all persons and supports protection available to applicants and employees under Federal law. The University will not practice or permit discrimination in employment on the basis of race, color, sex, national origin, religion, sexual orientation, age, disability, or veteran status. Employment decisions are based on good faith assessments of individual, professional merit, and job-related criteria (bona fide occupational qualifications). The Office of Human Resources works with other University departments to ensure that all employment practices operate to prevent discrimination, and that all personnel actions are administered fairly and consistently.

**Craigie Residence Hall**

The Department of University Housing invites students to consider on-campus housing in Craigie Hall. This facility is devoted to single graduate students, upper-level undergraduates, and junior transfer students for the convenience of on-campus living. It is also home to most of the University's international students. University Housing manages the facility with students in mind. Conveniently located, it lies across the street from dining facilities and less than a block from the University Hospitals, medical school, dental school, allied health classrooms, and the Craigie parking deck. It is only a ten-minute walk to the law school. In addition, Craigie offers its own laundry facilities, fifteen-station computer lab connected to the University broadband network, and a variety of recreational facilities and equipment.

Craigie is open for continuous occupancy year-round. Students may contract separately for the entire academic year and the summer.

The building itself is six-story brick with four wings per floor arranged in a suite system. There are three to four suites per wing. Each suite has four bedrooms and a shared bathroom and houses no more than eight people. A large number of single as well as double rooms are available. Rooms are furnished and equipped with one wall modular jack for telephone hook-up. Local phone service is included in the room rent at no extra charge.
Residents are responsible for providing their own telephone. Each suite opens onto a covered, open air balcony. A total of five hundred and fifty students currently reside in Craig Hall.

**Student Family Housing**

The department also operates a Student Family Housing Complex which consists of 306 one- and two-bedroom apartments conveniently located one mile south of the center of campus and adjacent to the University Hospitals.

**Summer School Housing and Additional Information**

Additional information regarding housing accommodations including contract responsibilities, fees, and application procedures is available by writing to: Department of University Housing, Assignments Office, CB# 5500, Carr Building, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-5500; Web: housing.unc.edu.

**Off-Campus Housing**

The following resources may be helpful to students looking for off-campus housing in the Chapel Hill/Carrboro and Durham communities:

- A student-operated Housing listserv (regular postings of housing opportunities by and for students!)
  To subscribe send an email message to listserv@unc.edu.
  Leave the subject line blank.
  In the body of the message type only: subscribe unchouse
  <Your Name>. Type your name here (without the brackets) one space after you type unchouse.

- Apartment Locator Information Center
  In North Carolina 1-800-672-1678
  Nationwide 1-800-334-1656

- Apartment Information on the Web:
  www.homefair.com/aptnc.html
  ils.unc.edu/~harcc/guide.html

- The Village Advocate (on-line) www.villco.com/advocate
  For a sample copy (919) 968-4801

- Local publications with classified ads for apartment and home rentals
  Chapel Hill News (919) 932-2000
  Independent (Durham, the Triangle area)
  (919) 933-3057
  Durham Herald (919) 419-6700
  Raleigh News & Observer (919) 829-4500
  www.nando.net/classads

**STUDENT DINING SERVICE**

Carolina Dining Service (administered by the Marriott Corporation) operates at seven on-campus locations: Lenoir Dining Hall; Union Station, a grab n’ go operation located in the Student Union; Chase Hall, an unlimited seconds dining facility on South Campus; and the South Campus Mini Mart.

Carolina Dining Services offers meal plans on an à la carte basis (cash card) and a meals per week basis (Seconds Please!). Students determine which meal plan level best suits their needs. The UNC ONE Card serves as a meal card, and works like cash in all Carolina Dining Services facilities. Meals are available on a cash basis as well. UNC-Chapel Hill students registering for a meal plan will not pay a six percent sales tax on their purchase. Carolina Dining Services will contact all residence hall students by mail and during the Testing and Orientation Program sessions regarding available meal plans and services. For additional information, contact Carolina Dining Services, CB# 1505, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-1505 or call (919) 962-0200.
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 unauthorised 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.

—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, using 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 an 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.

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 both to prosecution 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 discharge 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 Employee Relations Division of the University Personnel Department.

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 dormitory 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 committed to equality of educational opportunity and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, sexual orientation, age, disability, or veteran status. Any complaints alleging failure of this institution to follow this policy should be brought to the attention of the Affirmative Action Officer. Moreover, The University of North Carolina at Chapel Hill is open to people of all races and actively seeks to promote diversity in the student population by recruiting and enrolling a larger number of Black, female, and other minorities, as students.
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 Employee Relations Division of the University Personnel Department.

RACIAL HARASSMENT

Discrimination on the basis of race is unacceptable at UNC-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 Employee Relations Division of the University Personnel Department.

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 of 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 Employee Relations Division of the University Personnel Department.

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 race, sex, religion, and national origin. 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 Employee Relations Division of the University Personnel Department.

DIVISION OF STUDENT AFFAIRS

The Office of the Vice Chancellor for Student Affairs (located in 102 Steele Building) coordinates the division's programs and provides guidance and leadership for its departments. The office also acts in 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.

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 the administrative coordination of the Student Judicial System, staff members of the office also work with leaders of a variety of extracurricular organizations. (919) 966-4041 (CB# 5100).
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 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. Permanent programs of the center include sauti mpya (the center’s literary journal), Community University (community Saturday school), and the Cross Cultural Communications Institute (CCC).

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

Services for Disabled Students

The University of North Carolina at Chapel Hill provides equal opportunity in higher education to academically qualified students who have disabilities that may require some accommodations, so that these students may independently meet the demands of university life.

The Department of Disability Services ensures that the University’s programs and facilities are accessible to all students. Services are designed and developed on an individual needs basis, and students may elect to use any or all of the services appropriate to their needs at no charge.

A visit to the campus before acceptance or matriculation is also recommended, at which time the applicant may meet with Department of Disability Services personnel to discuss questions and special concerns. Visits may be arranged by writing to the Director, Department of Disability Services, CB# 5100, Steele Building, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-5100, or by calling (919) 966-4041 (Voice/TDD).

University Career Services

University Career Services assists students who have identified their career direction.

Services for graduate students include workshops on résumé-writing, interviewing, and job-seeking skills; résumé-referral to employers; individual career advising; on-campus interviewing; job vacancy notebooks and Internet listings; and a reference file for students in selected curricula. Some services are limited to students 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 job hotline, an automated alumni network service, various employer databases, and a UCS home page.

Students in M.B.A., M.A.C., 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.

Office hours are from 8:00 a.m.-5:00 p.m. Resource Room hours are 8:00 a.m.-8:00 p.m., Monday through Thursday.

UCS@unc.edu. Home page: www.unc.edu/depts/career.

The 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 present at The University of North Carolina at Chapel Hill. 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 foreign 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 designed to help foreign 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. The UNC Class of ’38 Summer Study Abroad Fellowships are also administered by the center.

The 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 providing opportunities for cooperation in addressing the needs of both groups. Students participate in Y-sponsored committees, some of which are engaged in community outreach (such as the Big Buddy, Elderly Exchange, and Tutoring programs), while some are concerned with social issues (such as Human Rights Week and the Women’s Issues). Other Y committees are involved in global action (such as Hunger Action and the South African Scholarship Fund) or in fund-raising for the Y (e.g., the Footfalls Road Race). In addition to involvement in these and other committees, the opportunity exists for students to 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 (in Room 102 of the Campus Y Building) to learn about volunteer service and University, local, and global issues.

The Carolina Union

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.

Composed of the president and chairpersons of committees (selected through open interviews in spring semester), the Carolina Union Activities Board provides valuable leadership and developmental experiences for the students involved.

Students interested in committee work may apply in early fall or
contact the committee chairpersons (Room 200 in the Union).

Also housed in the Frank Porter Graham Student Union Building are the offices of other major student organizations, including: Student Government; The Graduate and Professional Student Federation; Bisexuals, Gay Men, Lesbians, and Allies for Diversity (B-GLAD); The Daily Tar Heel; Black Ink; Yakety Yak; The Black Student Movement; WXRY radio; the Residence Hall Association; Student Television; the Black Cultural Center; the International Center; North Carolina Fellows; Student Legal Services; and the Student Activities Fund Office.

The Union building provides many facilities for students’ use. There are lounges with comfortable furniture; an art gallery; a movie auditorium; the Union Cabaret, providing live entertainment several days a week; bowling lanes, billiards tables, and video games; a lounge for chess, checkers, and cards; three large-screen television sets; vending machines; an information desk; and a ticket office.

The Central Reservations Office (Room 204) serves recognized student organizations by providing meeting spaces, both in the Union and in other buildings throughout the campus.

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.)

The Union Station, on the first floor of the Union, is run by Carolina Dining Services and offers freshly made sandwiches, Taco Bell Express, and baked goods, as well as snack foods and drinks.

**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.

**Student Government**

The Graduate and Professional Student Federation is the official sponsor 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.

Graduate students, whether as a result of individual interest or because of teaching assistantships, may want to learn more about student government. Listed below are student officers and organizations:

1. **Executive Branch**
   - Officers—President, Vice-President, Treasurer, Secretary, Executive Assistants, Elections Board Chair
   - B. Examples of committees that address various areas of student concern:
     - Association of Student Governments
     - Handicapped Services
     - Community Liaison
     - Parking
     - Campus Security
     - Publicity
     - Chancellor's Committees
     - Special Projects
     - Education/Academic Affairs
     - Tuition and Financial Aid
     - Minority Concerns
     - Women’s Issues

2. **Judicial Branch**

   **Student Courts (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.

3. **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.

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 Enforcement, and subsequent violations may result in further citations, immobilizations ("booting"), or towing of the vehicle. All citations may be appealed through the Department of Transportation and Parking's Appeals Office. Appeals can also be entered by telephone by calling the Appeals Office at 962-3953. Appeals Office hours and phone hours are weekdays from 7:30 a.m. through 5:00 p.m.

The Parking Enforcement Division also operates M.A.P. (Motorist Assistance Program) offering jump starts or lock-out key retrievals to any vehicle on campus. M.A.P. may be contacted at the Parking Enforcement Office at 962-8006 on weekdays between 6:00 a.m. and 12:00 midnight. For motorist assistance on weekends or between 12:00 midnight and 6:00 a.m., contact UNC Police at 962-8100.

Visitor parking is available in one of the five visitor/patient pay parking areas on the UNC campus: the Health Affairs Parking Deck (across from UNC Hospitals), the Hanes Visitors' Lot (Cameron Avenue), the Ambulatory Care Lot (Mason Farm Road), the Hill Alumni Center Lot (in the Ramseur Hide Lot), and in the NC 54 Visitors' Lot (diagonally across South Road from the Institute of Government). Parking rates are 75¢/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 weekends). Parking is also available at any of nearly two hundred metered spaces on campus. Most meters are activated at a rate of 25¢/half-hour.

Alternatives to Parking

- The UNC Department of Transportation and Parking also sponsors many programs offering viable alternatives to parking on campus, such as:
  - UNC-CAR—University of North Carolina Campus Area Ridesharing, offering "matchmaker" services to those campus-affiliated students and personnel who wish to engage in carpooling or vanpooling.
  - UNC Bicycle Registration—The Department of Transportation and Parking implements a cost-free bicycle registration program for bicycles stored or traveling on campus. The program serves as a deterrent to crime, it can aid in the identification of lost or stolen bicycles, and it also enables our department to better plan for improved bicycle parking facilities around the UNC campus in the future.
  - Chapel Hill Transit and Park and Ride—Chapel Hill Transit bus passes (unlimited town-ride passes, unlimited campus-ride passes, or twenty town-ride/fifty campus-ride coupon booklets) may be purchased at either the Department of Transportation and Parking or at the UNC Student Stores. Rates reflect up to a 40 percent savings relative to cash fares. Anyone may board the Campus "L" route, offering fare-free service on a fixed-loop route around campus, weekdays from 7:00 a.m. until 7:00 p.m.
  - UNC Point-to-Point Campus Shuttle—The Department of Transportation and Parking 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 UNC employees, 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 962-ProP (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 Xpress—The P2P program also offers the Point-to-Point Xpress 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 at roughly twenty-minute intervals during peak service. Students, staff, or faculty must show a UNC ONE Card or campus ID when boarding.

For more information, visit the UNC Department of Transportation and Parking during our regular business hours (weekdays, 7:30 a.m.-5:00 p.m.), in the Security Services Building on Morrison Drive (just off Manning Drive) on south campus, or call 962-3951. Specific concerns may be addressed by calling 962-3951.
Publications, Research Funds, the Libraries, and Computer Services

SCHOLARLY JOURNALS

The University has published scholarly journals since 1884, when Journal of the Elisha Mitchell Scientific Society first appeared. Among the literary and linguistic publications are Hispaniola, North Carolina Studies in Romance Languages and Literatures, Romance Notes, Studies in Philology, and The University of North Carolina Studies in Germanic Languages and Literature. The Southern Economic Journal, published quarterly, includes articles by southern as well as other economists, and the North Carolina Law Review is aimed at stimulating research and publication by faculty and students in the School of Law. Research summaries and publications of faculty, alumni, and advanced students in history, political science, and the social sciences appear in Social Science and in the James Sprunt Studies in History and Political Science. The High School Journal attracts contributions from educational practitioners and theorists from all parts of the country, and Social Forces is one of the best known journals in sociology and related fields. While most of these journals welcome scholarly contributions from other parts of the country, they also reflect something of the persistent and visible spirit of research activity that is an important part of this University.

Endeavors features outstanding research and creative work undertaken by faculty and students at The University of North Carolina at Chapel Hill. The Office of Graduate Studies and Research publishes the magazine, which has been produced since 1984. Distributed free, the magazine reaches 8,600 on- and off-campus readers in an effort to engage others in Carolina research.

RESEARCH FUNDS

In fiscal year 1997, The University of North Carolina received $290.7 million in sponsored funding for research, training, and public service. The GrantSource Library, 307 Bynum Hall, offers UNC-Chapel Hill faculty, staff, and graduate students information on funding sources for independent research, collaborative projects, fellowships, travel, and educational expenses. In addition to the research sponsored by research institutes and that financed by contracts, grants, and cooperative agreements from outside agencies, the University Research Council awards grants twice a year (during the fall and spring semesters) for study, research, and publication by the University's faculty members. Information and application forms for these grants are available from the Office of Research Services, 300 Bynum Hall or at groucho.admin.unc.edu.

The Smith Graduate Research Fund supports small grants for thesis and dissertation research expenses. Information and application forms for these grants are available from the Graduate School, 218 Bynum Hall. Additional funds for research are awarded twice yearly by the Graduate School as R. J. Reynolds Research Fellowships for doctoral students whose dissertation research must be conducted off-campus; a limited number of Graduate School Transportation Grants are available for doctoral students in their last year of research who present papers at professional meetings.

THE UNIVERSITY OF NORTH CAROLINA PRESS

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.
effective working library, a laboratory for the use of students whose research must be carried on mainly by means of books, as well as an instrument contributing to general culture. The holdings increase through gift and purchase at the rate of more than 100,000 volumes a year.

Special collections are housed in Wilson Library. The North Carolina Collection contains more than three quarters of a million items relating to the state and its people, ranging in date from the sixteenth century to the present, and including books, pamphlets, maps, newspapers, serials, broadsides, microforms, documents, and recordings. Two of its special 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 some 411,000 negatives, prints, and post cards, including examples of all formats beginning with daguerreotype of the 1840s. The North Carolina Collection Gallery exhibits textually and visually the history and culture of the state and the University through artifacts, art, and furnishings.

The Southern Historical Collection preserves the private papers — letters, diaries, account books, broadsides, photographs, taped interviews, and video documentaries — 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, while 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 Folklore 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 comprises several special collections of over 111,000 scarce books, pamphlets, and broadsides; 1,200 medieval and Renaissance manuscripts; and 16,000 graphic images which have had a significant role in transmitting knowledge and culture through the ages. Materials of particular interest include the Estienne Imprints, the Bernard J. Flotow Collection of the Cronistas, 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 Rare Book Collection receives special support from the Hanes Foundation for the Study of Origin and Development of the Book both for the purchase of important acquisitions and for the internationally renowned Hanes Lecture, a scholarly lecture series concerning the history of books and printing.

The University Library receives nearly 44,000 periodicals and other serials annually, including the publications of professional associations and learned societies. More than 200,000 bound volumes of periodicals of permanent worth are available from the beginning of their publication, constituting a working collection of great value to advanced students. The library also receives the publications of such organizations as the Smithsonian and Carnegie institutions, the Rockefeller Foundation, the Hispanic Society of America, the Russell Sage Foundation, and of many universities, including foreign universities and academies, which issue monographs important in research.

The government document collections comprise a rich body of resources. The 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, in which there is special strength on the federal, congressional, and executive series; state legislative journals, laws, collected documents, colonial and state records; and records of constitutional conventions.

The library also provides access to an array of bibliographic, statistical, and textual machine-readable datafiles and compact disks which can be searched by graduate students, with staff assistance available. Internet access is also available through the Electronic Information Service, with both individual and class instruction in identifying and accessing discipline-specific sources. Dial-up searches of databases available through the online catalog are possible. Searches of additional databases at remote locations may be done by librarians at the request of students and faculty. Facilities are also available for accessing books, manuscripts, and other materials on microfilm and microfiche, with special readers and photocopiers provided.

Departmental libraries containing special collections for graduate study and research are assigned to Art, Biology, Chemistry, City and Regional Planning, Geology, Institute of Government, Information and Library Science, Mathematics/Physics, and Music. The Law Library, containing approximately 287,500 volumes, is located in the building occupied by the School of Law. It contains material useful to students of history and government.

In addition to the collections available in-house, the library provides access to a multitude of external resources. It enjoys the privilege, through interlibrary loan, of borrowing publications that it does not possess from other academic and research libraries and from the Center for Research Libraries. Advanced students also have the privilege of using the valuable manuscripts of the State Department of Archives and History and the State Library at Raleigh. The resources of libraries at UNC-Chapel Hill, Duke University, and North Carolina State University are readily available through their online catalogs. Graduate students may obtain borrowers’ cards from the Circulation Department Interlibrary that entitle them to direct borrowing privileges and stack access at Duke and the other
fifteen campuses of The University of North Carolina.

Both Davis and House Libraries have open stacks and single exit control.

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, over 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 on-line 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. On-line search services, with access to MEDLINE and about a hundred other databases, are also provided. Direct access to databases is offered through the UNCLE system (University of North Carolina Literature Exchange) 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 UNCLE 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. For a virtual tour of all UNC-Chapel Hill library facilities go to groucho.admin.unc.edu.

INFORMATION TECHNOLOGY SERVICES

UNC'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/tac, or by telephone at 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 LoginID that can be used for e-mail and other services. Each student, for example, can have a World Wide Web personal page 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 LoginID. It is no longer necessary to go to a central location such as the Technical Assistance Center to create a LoginID.

Off-campus students may want to consider UniverseCity, an Internet access package developed by BellSouth with the cooperation of area universities. For one of the three different fee levels, students can obtain guaranteed access to their e-mail accounts and the Web. The service is also available to on-campus students living in dorms not yet wired to the fiber-optic network. ATN will continue to offer its no-charge dial-in service on a limited number of modems.

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 www.unc.edu/depts/atn or call 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 home page at URL www.unc.edu/depts/atn under Client Support: Training Center, or call 962-1160.

ATN makes SCOLA foreign language news broadcasts available twenty-four hours per day. Language majors use this service in their studies, and international students can hear news from home in their native language.
Research Institutes, Centers, and Laboratories

The intellectual life of the University and the research activities of graduate students and faculty alike receive valuable encouragement and support from various institutes and centers. 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. Listed below are institutes and centers at the University, many of which provide opportunities for graduate student training.

INSTITUTES

Developmental Disabilities Training Institute
The Developmental Disabilities Training Institute provides training to persons working with mentally retarded and developmentally disabled individuals at the community and institutional levels.
(919) 966-5463

Institute for Academic and Professional Leadership
The Institute for Academic and Professional Leadership (IAPL) provides professional development for upper- and middle-level academic leaders at community colleges, junior colleges, specialized schools, and four-year colleges and universities.
(919) 962-3276
www.unc.edu/depts/iapl

Institute for Academic Technology
The Institute for Academic Technology (IAT) is a national research and development center for the application of information technologies to learning, instruction, and research. The focus of the IAT’s work is on state-of-the-art and next-generation networked academic delivery systems for courses and curricula, training, and performance support. The IAT works with UNC faculty and academic units to design and develop computer technology systems and applications that enhance the University’s capacity to meet its teaching and service missions. The IAT, through grants, contracts, and partnerships with corporations and other universities, advances the research mission of the University as a major developer of intellectual property and evaluator of instructional technology implementations.
(919) 962-9290
www.iat.unc.edu

The Institute for African American Research
The mission of the Institute for African American Research is to promote the scholarly investigation of the culture and thought of African Americans, as well as Blacks throughout the diaspora. The institute supports projects that examine the impact of the African diaspora on Black life and culture in the United States. The Institute for African American Research serves as an advanced study center on Black life.
(919) 962-6810

Institute for Economic Development
Conducts research, policy analysis, and professional instruction on the public and private economic development of localities, regions, and states in the United States and abroad.
(919) 962-4759
www.unc.edu/depts/dcrpweb/oppres.htm

Institute for Environmental Studies
The institute for environmental studies is administratively located within the department of environmental science but has a campus-wide mission to serve as a focal point for interdisciplinary research, teaching, and service in environmental studies. The purpose of the institute is to foster collaboration in studying the use of scientific information in establishing environmental policies. This includes the study of issues related to the quality of scientific prediction, computation, and philosophical analysis. The collaboration brings together diverse units from the UNC-Chapel Hill campus, from other campuses in the UNC system, from other colleges and universities, and from governmental, industrial, and private organizations.
(919) 966-6026
www.sph.unc.edu/ies

Institute for Research in Social Science
The Institute for Research in Social Science (IRSS) exists primarily to support the research, sponsored or unsponsored, of UNC’s social science faculty. As resources permit, IRSS also serves the research and information needs of graduate students, other UNC faculty, and administration. It has long played an important role in undergraduate and, especially, graduate instruction in social science.
(919) 962-3061/3062
www.unc.edu/depts/irss

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/aandh.html

**Institute of Government**  
The Institute 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  
www.ncinfo.iog.unc.edu

**Institute of Latin American Studies**  
The Institute of Latin American Studies (ILAS) was created in 1940 to coordinate campus activities. 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

**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.  
(919) 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) 962-4212  
www.unc.edu/depts.outdoor

**The Jordan Institute for Families**  
The Jordan Institute for Families 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.  
(919) 962-1225  
ssw.unc.edu/jif

**Frank Hawkins Kenan Institute of Private Enterprise**  
The 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.  
(919) 962-2133  
www.bschool.unc.edu/kenan_institute/index.html

**Triangle Institute for Security Services**  
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) 962-8601  
www.unc.edu/depts/tiss

**The Water Resources Research Institute**  
The Water Resources Research Institute was established in 1964 to strengthen research and graduate education in water resources.  
(919) 515-2815  
www2.ncsu.edu/ncsu/wrrt/inst

**CENTERS**

**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) 966-1717  
newby.cpc@mhs.unc.edu  
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) 966-2157  
priscilla_guild@unc.edu  
www.shepscenter.unc.edu/home2.html
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.
(919) 962-0650
gmnelson@email.unc.edu
iff.sowo.unc.edu/cares/cares.htm

Center for Competitiveness and Employment Growth
Researches demographic, economic, and political forces underlying competitiveness, productivity, and job creation dynamics for private and public sectors.
(919) 962-8201
www.bschoole.unc.edu/inforenters/kenan_institute.html

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
briceno@email.unc.edu
www.cds.unc.edu

Center for Distance Learning and Health Communication
The mission of the Center for Distance Learning and Health Communication is to advance the knowledge base and practice of public health through educational outreach and health communications. The center, in partnership with state, national, and international organizations, serves School of Public Health faculty and health and human services professionals in North Carolina, the nation, and the world.
(919) 966-6266
judy_beaver@email.unc.edu
www.sph.unc.edu/cdlhc

Center for Educational Leadership
The role of the Center for Educational Leadership is to develop organized relationships among the university's educational programs, the School of Education, and the public schools of North Carolina.
(919) 966-7000
cleggw@email.unc.edu
www.unc.edu/depts/ed/CEL.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) 932-0126
bromber.phillip@epamail.epa.gov
www.med.unc.edu/envlung

Center for European Studies
The Center for European Studies assists Europeanists (faculty, graduate students, undergraduates, and interested persons outside the University community) across academic disciplines at the University of North Carolina at Chapel Hill in pursuit of their research, teaching, and studies.
(919) 962-2494
rpmirts@email.unc.edu
www.unc.edu/depts/europe

Center for Gastrointestinal Biology and Disease
The Center for Gastrointestinal Biology and Disease promotes research and teaching in 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 two constituent members of North Carolina's university system—the University of North Carolina at Chapel Hill, where the activities are based largely at 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 these different but complementary institutions makes the center unique.
(919) 966-1757
deve@med.unc.edu

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 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
uncchv@email.unc.edu
www.unc.edu/home/sherrman/chv/pages/Welcome.htm

Center for Multiculturalism in Nursing
The purpose of the center is to bring together the strengths and resources of the nursing programs at UNC-Chapel Hill and NCCU to increase underrepresented minorities in nursing, to gain and transmit knowledge about working with diverse people in health care, and to create ethnic, cultural, and gender sensitive environments in the two schools.
(919) 966-7768
esmall.unccon@mhs.unc.edu
www.unc.edu/depts/rsc/ncresou.htm

Center for Multiphase Research
The focus of research at the CMR is flow, transport, and reaction phenomena in complex subsurface systems. Ongoing activities within the CMR include small and intermediate scale experimental investigations, mathematical model development and
application, and stochastic analysis of flow and transport phenomena.

(919) 966-2643
lara_freeburg@unc.edu

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 advances the field of health outcomes through methodology development, evaluative research, and the translation of research findings to clinical practice and pharmaceutical education.

(919) 962-0106
bhartzem.pharm@mhs.unc.edu

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 CPCI 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
crc@unc.edu

Center for Slavic, Eurasian, and East European Studies

The mission of the Center for Slavic, Eurasian, and East European Studies is coherently with the University’s mission to generate, preserve, transmit, and disseminate useful knowledge. It is particularly honed to the knowledge pertaining to the languages, cultures, and political systems of the Slavic, Eurasian, and East European peoples and countries.

(919) 962-0901
slavic@email.unc.edu

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 very extensive research production, as may be seen from the technical reports of the center and the published papers.

(919) 962 0120
panitch@stat.unc.edu

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 promotes open and ongoing dialogue among all members of the University community. Additionally, it serves as an advocate for academic initiatives, as these enterprises relate to teaching and learning.

(919) 966-1289
ctl_unc@unc.edu

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
csas@email.unc.edu

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
jwelch@med.unc.edu

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 community living conditions. 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
jones.curs@mhs.unc.edu

Clinical Center for the Study and Development and Learning

The Clinical Center for the Study and 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
mlevine@css.unc.edu

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
rtboucher@unc.med.edu

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.

(919) 966-1538

Design and Educational Support Center
The mission of the Design and Educational Support Center in the School of Nursing is to improve the communication of information in order to strengthen teaching and learning for its clients and their constituencies.

(919) 966-3601

Frank Porter Graham Center
The research mission of the Frank Porter Graham Center 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

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

General Clinical Research Center
The mission of the 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

Hargrove "Skipper" 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

Highway Safety Research Center
The center 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

Human 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) 966-0907

Injury Prevention Research Center
The mission of the UNC 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
unciprc@unc.edu

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 serves as the focal point for cancer research and cancer-related activities at UNC-Chapel Hill. The center 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.

(919) 966-3036

**National Center for the Paideia Program**

The mission of the center is to: act as an information clearinghouse for schools nationwide that are establishing Paideia programs; provide training in Paideia methods and technical assistance to interested schools and educators; create a group of Paideia schools to serve as national demonstration sites for implementation; and continue research on and evaluation of the results of Paideia methods.

(919) 962-7379
npc@unc.edu

**The Neuroscience Center**

The mission of the Neuroscience Center is to advance knowledge in all areas of basic and clinical neuroscience.

(919) 966-2405

**Occupational Safety and Health Education Resource Center**

The OSHERC is an inter-institutional, multidisciplinary organization committed to graduate education and training of occupational health professionals.

(919) 962-2101

**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
rc@unc.edu

**Small Business and Technology Development Center**

The SBTDC's mission is to support the growth and development of North Carolina's economy by encouraging entrepreneurship, assisting in the creation and expansion of small businesses, and facilitating technology development and transfer.

(919) 715-7272

**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
shbcc@email.unc.edu
www.unc.edu/student/source/file.16.html

**Thurston Arthritis Center**

Independence is an American right. Self-sufficiency is an American ambition. Freedom of movement is an American assumption. The Thurston Arthritis 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

**University Center for International Studies**

The 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

**LABORATORIES**

**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 curates one of the nation's finest collections of Southeastern archaeological materials, including over 5,000,000 artifacts, extensive photographic collections dating from the 1930s, and smaller archaeological and ethnographic collections from Latin America, Europe, and Japan.

(919) 962-6574

**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
Departmental Listings of Graduate Faculty and Courses of Instruction

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 member's 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. As many as three 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

DOROTHY C. HOLLAND, Chair

Professors

Carole L. Crumley (22) Landscape and Historical Ecology, Archaeology, Ethnohistory, State Societies, Europe
Terence M. S. Evers (5) Social Anthropology, Social Theory, Utopian and Communal Societies
Kaja Finkler (32) Medical Anthropology, Gender and Health, Modernization, Social Cultural Change, Latin America
Dorothy C. Holland (16) Anthropology of Schooling and Work, Identity and Political Movements, Critical Psychology, Gender, Cultural Studies, the United States and Nepal
Norris B. Johnson (25) Art and Architecture, Landscape, and Spatial Anthropology, Japan
Clark Spencer Larsen (43), Biological Anthropology, Human Osteology, Bioarchaeology, Paleoanthropology, North America
Catherine A. Lutz (41) Gender, Critical Theory, Mass Media, Militaries and Societies, Ethnopsychology, Pacific and the United States
James L. Peacock (11) Culture, History, and Self, Southeast Asia and the United States
Vinca P. Steponaitis (2) Archaeology, Complex Societies, Southeastern United States
Bruce P. Winterhalder (27) Ecological Anthropology, Evolutionary Ecology, Hunter-Gatherers, Subarctic (Canada), Andes

Associate Professors

Robert E. Daniels (4) Social Anthropology, Culture and Personality, Africa

Judith B. Farquhar (33) Medical Anthropology, Critical Theory, Chinese Societies
Glenn D. Hinson (36) Folklore, Public Folklore, Ethnography of Communication, Belief Studies, Southern United States
Paul W. Leslie (37) Human Ecology, Demography, Genetics, East Africa
Donald M. Nonini (34) Transnationalism, Anthropology of Work, Political Anthropology, Critical Theory, Southeast Asia, The Chinese Diaspora, The United States

Assistant Professors

Marisol De La Cadena (50) Identity, History and Anthropology, Critical Theory, Militarism, Social Movements, Intellectuals, South and Central America
C. Margaret Scarry (48) Paleoethnobotany, Archaeological Theory and Method, Eastern United States
Margaret J. Wiener (47) Social and Cultural Theory, Power and Representation, Southeast Asia (Indonesia)

Adjunct Professor

Sue E. Estoff (31) Medical, Psychiatric Anthropology

Adjunct Assistant Professors

Valerie J. Kaulund
William S. Lachicotte Jr., Anthropology of Professions, Social Studies of Psychology and Psychiatry, Cultural Production of Knowledge, The United States
Michael C. Lambert, Economic and Political Anthropology, Political Violence, Africa

Research Professors

Richard E. Kay (52) Biological Anthropology, Anatomy
Robert I. Levy (38) Psychological Anthropology, Cultural Anthropology, Polynesia, Nepal
Stuart Marks

Research Associate Professors

John Scarry (49) Archaeology, Southeastern United States, Chiefdoms, Spanish Colonial Period
Debra Skinner (46) Psychological Anthropology, Anthropology of Schooling, Culture and Disability, South Asia (Nepal) and The United States

Research Assistant Professors

Laurie C. Steponaitis (35) Archaeology, Coastal Adaptations, Middle Atlantic United States

Professors Emeriti

Donald L. Brockington
Joffre L. Coe
Julia G. Crane
John Gulick
Richard A. Yarnell

The department 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 adviser, 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, genetics, geography, linguistics, philosophy, psychology, or sociology 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 Institute for Research in Social Science, the Institute of Latin American Studies, the Carolina Population Center, the University Program in Cultural Studies, and the Research Laboratories of Anthropology and has various active training and research interests in conjunction with other departments and schools of the University.

Courses for Graduates and Advanced Undergraduates
100 WORLD PREHISTORY (3). A course designed to provide anthropology majors and other students of comparable social science or humanities background with an understanding of the global-scale evolution of human culture. Spring. Curnley.

101 PREHISTORY OF THE FAR EAST (3). A course designed to acquaint anthropology majors and upper-level students from other fields with a general view of the prehistory of Siberia, China, Japan, and southeast Asia and Oceania.

102 ARCHAEOLOGICAL GEOLOGY (GEOL 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.

112 PALEOANTHROPOLOGY (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 OSTEOLOGY (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 (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.

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

120 CULTURE CHANGE AND UNDERDEVELOPED AREAS (3). Students discuss theories and case studies of cultural change. Problems of culture change in less developed areas of Asia, Africa, and Latin America receive particular attention. Fall. Nonini.

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 CULTURAL ANTHROPOLOGY (FOLK 122) (3). Recommended for students who have had Anthropology 41. Recommended for advanced undergraduates and graduate students who have little or no background in anthropology. A survey of anthropological approaches to the study of human cultural and social behavior, with some emphasis on the relation of anthropology to other social sciences. Fall. Staff.

123 MAGIC, RITUAL, AND BELIEF (3). An examination of the rationality of "magic and religious thought" in traditional societies. Some attention to scientific thought is included. Spring. Evans.

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.

126 AFRICA;PEOPLES AND CULTURE (FOLK 126) (3). Prerequisite, Anthropology 26, 41, 122, or permission of the instructor. Advanced ethnographic survey of cultures of sub-Saharan Africa; some emphasis on the historical development of major African sociocultural systems; application of anthropological theories to Africa and uses of African data in the development of such theories. Spring. Staff.

127 ABORIGINAL CULTURES OF MEXICO AND CENTRAL AMERICA (FOLK 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 SOUTHEAST ASIA: PEOPLES AND CULTURES (FOLK 129) (ASIA 129) (3). A survey of cultures in Indonesia, the Philippines, and mainland Southeast Asia. Traditional influences and the impact of major contemporary changes in societies of the area are discussed. Spring. Peacock.

130 NATIVE NORTH AMERICAN CULTURES (FOLK 130) (3). A broad survey of the traditional life ways and customs of Native North Americans, with some emphasis on the impact made by historical contacts with Euro-Americans. Current issues affecting Native American groups are also addressed. Fall or spring. Staff.

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

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

133 THE PEOPLE OF THE CARIBBEAN (3). A survey of Caribbean cultural development. Particular attention is given to human ecology, population segments, metropolitan influences, and culture change. Fall. Staff.


135 CONSCIOUSNESS AND SYMBOLS (FOLK 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 KINSHIP AND SOCIAL ORGANIZATION (3). Prerequisite, permission of the instructor. Intensive study of kinship and marriage systems through Australian, African, and Asian cases. Historical, functionalist, structuralist approaches, descent and alliance theories, and the relation of kinship to social organization and social structure. Fall. Staff.

137 MODERN CULTURES OF THE MIDDLE EAST (3). Desert-oasis ecological adaptations and communities; the peril-refuge dialectic within political structures, religions, kin groups, and the self. The course emphasizes directly observed present-day behavior patterns from Morocco to Afghanistan. Fall. Staff.

138 LANDSCAPE AND SPATIAL ANTHROPOLOGY (3). Study of conceptions of nature and the natural environment within a variety of prehistoric, historic, and contemporary societies. Archaeological and ethnographic emphasis on the symbolic meanings of religious and political spatial landscapes. Spring. Cruenley, Johnson.

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

140 GENDER AND CULTURE (WIST 140) (3). Cross-cultural perspectives on the social use 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. Finkler and staff.

142 RELIGION AND ANTHROPOLOGY (FOLK 142, RELI 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.

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

147 SELF AND SOCIETY IN JAPAN (ASIA 147) (3). Prerequisite, one course on Japan, one upper-level course in anthropology (sociocultural), or instructor's permission. An introduction to contemporary Japanese society focusing on organization of self and relationship of self to social community. Course proceeds through case examination of small-group contexts in different social strata. Fall. Staff.

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 the 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.

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


162 THE ANTHROPOLOGY OF SPACE AND POWER (3). Investigation of the relationships between space, power, and cultural representations in modern urban life. Draws on a variety of sources to examine the cultural politics of built forms, architecture, and urban planning. Fall. Nonini. Approved to fulfill the cultural diversity requirement.

164 FOUNDATIONS OF SOCIAL ANTHROPOLOGY (3). Intensive study of theory in social 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. Eves.
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 ethnohistorical, 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.) Crane, Nonini.


171 SOCIOLINGUISTICS (LING 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.

172 CULTURAL FACTORS IN POPULATION PLANNING (3). Prerequisite, permission of the instructor. Cultural factors bearing on the need, ethics, design, and implementation of programs attempting to deal with population growth. Spring. Staff.

173 ANTHROPOLOGY OF THE BODY AND THE SUBJECT (3). Prerequisite, Anthropology 170 or permission of the instructor. Anthropological and historical studies of variation in 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 (RELI 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 and 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 multitemporal approach to explore factors forming the European identity. As the European Economic Community nears 1996, the exploration of unifying cultural themes is particularly timely. Spring. Craneley.

178 THE CHINESE DIASPORA IN THE ASIA PACIFIC (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 (LING 100) (3). (See Linguistics 100 for description.) Fall and spring.

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

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

182 CONTEMPORARY CHINESE SOCIETY (ASIA 182) (3). No prerequisites. This course draws on recent sociological and anthropological research in the People's Republic of China. autobiography, film, and fiction are used to explore contemporary Chinese society and culture. Spring. Farquhar.

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

184 LANGUAGE AND CULTURE (LING 184) (3). The relationship of language to other aspects of culture for the analysis and description of cognitive and affective features of the semantic component of language. Spring. Holland.

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 (FOLK 188, RELI 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.

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

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

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

195 ARCHITECTURE AND CULTURE (3). Cross-cultural survey of vernacular architecture and domestic houses in a variety of contemporary, historic, and prehistoric societies. Intensive study of the ideology of design forms and the construction of place and symbolic space. Fall. Johnson.

196 THE GARDENS, SHRINES, AND Temples OF JAPAN (ART 192) (Asia 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)

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 SOCIOCULTURAL 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 SOCIOCULTURAL 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.

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/FOLK 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.

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

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 (LING 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 SEMINAR IN MARXIST ANTHROPOLOGY (3). A survey and interrogation of major writings within the Marxist critical tradition as these have illuminated central problems within anthropology, and an introduction to important recent research in Marxist anthropology. 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. Farquhar, 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. Estoff.

253 GENDER, SICKNESS, AND SOCIETY (WMST 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 (intensive), ontogenetic, and cross-cultural perspectives. Spring. (Alternate years.) Holland and Winterhalder.

259 SOCIAL FORMATION OF MIND (3). This seminar considers the sociogenic theories of human consciousness of L. S. Vygotsky and G. H. Mead. Includes precursors, modifications from a Bakhtinian perspective, reformulations in activity theory, and current extensions in anthropology. Fall. 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 concepts of authority in various Asian, African, and American preliterate societies. The course relates law with the economy, social organization, religious ideology, and political instruments 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.

270 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.

271 ARCHAEOLOGICAL THEORY (3). Prerequisite, permission of instructor. Examination of historic and contemporary trends in archaeology informs the practice of anthropology and explores the interface between the social and natural sciences. Integration with general anthropological theory is assumed. Spring. Cummins, Steponaitis.

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

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

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

297 ART OF ETHNOGRAPHY (FOLK 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. Hinson.

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.

400 GENERAL REGISTRATION (0).

CURRICULUM IN APPLIED AND MATERIALS SCIENCES

ROYCE W. MURRAY, Chair

Professors
Miles A. Crenshaw (Pediatric Dentistry) Nucleation and Growth in Bimetalnolization
Joseph M. DeSimone (Chemistry) Polymeric Materials Synthesis
Robert P. Kusy (Orthodontics and Biomedical Engineering) Orthodontic Materials/Properties of Materials
Richard W. Linton (Chemistry) Spectroscopic Techniques for Surface and Microanalysis
Carol Lucas (Biomedical Engineering) Mathematical Modeling of Materials
Laurie E. McNeil (Physics and Astronomy) Structure-Property Relations, Optical Spectroscopy
Thomas J. Meyer (Chemistry) Structured Interfaces at Electrodes
Royce W. Murray (Chemistry) Electron Transfer Active Polymers, Metal Clusters
Edward T. Samulski (Chemistry) Liquid Crystals and Liquid Crystal Polymers
Sean Washburn (Physics and Astronomy) Quantum Transport, Plasma Reactor Studies, Virtual Reality

Research Associate Professors
John J. Boland (Chemistry) Surface Nucleation and Growth
Nalin Parikh (Physics and Astronomy) Ion Beam Modifications and Analysis
Michael Rubinstein (Chemistry) Molecular Models of Polymers
Yue Wu (Physics and Astronomy) Quasicrystals, Nanocrystals, and Molecular Motion in Polymers

Research Assistant Professors
Jianping Lu (Physics and Astronomy) Theoretical Studies of Materials
Richard Superfine (Physics and Astronomy) Interfacial Ordering of Molecules
Frank Tsai (Physics and Astronomy) Synthesis of Artificially Structured Materials

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 and optical materials, polymeric materials, and biomaterials. Students pursuing M.S. and Ph.D. degrees in Materials Science begin their studies with a core curriculum covering the fundamentals of materials and 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 three areas of research emphasized in the Materials Science program are electronic and optical materials, polymeric materials, and biomaterials. These three 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 three. For detailed information, please contact the Curriculum Office at (919) 962-6293 or e-mail materials_science@unc.edu.

Degree Requirements

All students must pass the following courses, or have passed their equivalents elsewhere: APPL 141, 143 and MTSC 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. The general regulations of the Graduate School govern credit hour, residency, and examination requirements.

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 spectrometry, and X-ray diffraction. In addition, a variety of equipment is located in individual research laboratories. This includes equipment for thermal analysis; polymer synthesis; FTIR; 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


MTSC 102 MATERIALS FABRICATION (3). Prerequisite, permission of the curriculum. Chemical and physical methods of materials fabrication including CVD, MBE, plasma deposition, sputtering, laser ablation, electrochemistry, evaporation, ion beams, and wet synthesis.

MTSC 103 THERMODYNAMICS, KINETICS AND DIFFUSION (3). Prerequisite, permission of the curriculum. Chemical thermodynamics and reaction kinetics in bulk materials and on surfaces. Heat transfer and mass transport in condensed phases.

MTSC 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, XFS, channeling and RBS, mechanical properties, optical spectroscopy.

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

MTSC 242 DEVICE PHYSICS AND ELECTRONIC PROPERTIES OF SOLIDS (3). Prerequisite, Physics 169 or APPL 141, MTSC 101, MTSC 103, or permission of the instructor. Survey of crystal structure, bandstructure, transport. Overview of FET's, heterostructures, light emission, dissipation, noise, integrated circuits, solar cells and ceramics. Emphasis on physical sources of device behavior.

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

MTSC 249 ION-SOLID INTERACTIONS (3). Prerequisite, APPL 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.

MTSC 250 NEW TECHNOLOGIES AND DEVICE ARCHITECTURE (3). Prerequisite, Physics 169 or APPL 141, MTSC 101, MTSC 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.

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

MTSC 394 DOCTORAL DISSERTATION (variable). Prerequisite, permission of the curriculum.
DEPARTMENT OF ART

MARY C. STURGEON, Chair
Jaroslav Folda, Assistant Chair for Art History
Jim Hirschfield, Assistant Chair for Studio Art

Professors
Jaroslav Folda (10) Medieval Art
Elizabath Grahowski (68) Printmaking, Painting, Drawing
Richard Kinnaird (11) Painting, Drawing
Arthur Marks (21) American, British Art and Architecture
Jerry Nixe (13) Sculpture
Mary Sheriff (36) Eighteenth, Nineteenth, and Twentieth Centuries
Mary Sturgeon (31) Ancient Art, Archaeology
Dennis Zaborowski (15) Painting, Drawing

Associate Professors
James Gadson (19) Painting, Printmaking, Drawing
James Hirschfield (82) Sculpture
Carol Mavor (94) Critical Theory, Modern Art
Mary Pardo (67) Italian Renaissance

Assistant Professors
Tammy Rae Carellan (136) Photography, Video, Digital Imaging
Michael D. Harris (131) African, African American Art History
Helen Hills (115) Baroque Architecture
Yun Dong Nam (128) Ceramic Sculpture
Elin Slavick (118) Mixed Media
Dorothea Verker (123) Medieval Art

Visiting Lecturers
Jane Malfinger (135) Installation Artist, Mixed Media
Richard Ryan (138) Painting, Printmaking

Adjunct Professors
Sherman Lee (61) Far Eastern Art
Timothy Ruggs (65) Sixteenth-, Seventeenth-, and Eighteenth-Century Prints

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

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

Adjunct Instructor
Evelyn Koehnline (106) Conservation of Art on Paper

Professors Emeriti
Robert Barnard
Robert Howard
Frances Huemer
Sara Immerwahr
J. Richard Judson
Kenneth Ness
Marvin Saltman
Joseph Sloane

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 79,000 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 volunteer work in collections research and museum education.

Admission

Deadline for applications for consideration for graduate school fellowships and assistantships is January 1. Graduate School application may be submitted via the online application for admission (www.adp.unc.edu/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 critique under the direction of a resident professor adviser. Further interaction with the studio faculty is mandated through a series of critique/reviews. In the first year, students interact with the whole studio faculty in a series of scheduled individual meetings. In the second year the student selects 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 an interaction with faculty and students 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, the faculty stresses 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, the faculty serves as guides and instructors in technique 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 (twelve) 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 (eight 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 coursework in art history and/or related fields. Course selections are made depending on the focus of the individual student’s research; selecting course work that 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 the twentieth-century art history. The remaining hours (three) are Master’s Thesis, taken in the final semester. The thesis hours basically indicate 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 Sloane 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**

The Master of Arts degree generally follows the requirements of the Graduate School as described in the section on graduate degree requirements or in the Graduate School Record or the
Handbook. A student admitted to graduate study in art history who has had adequate preparation in art history and foreign languages normally takes a minimum of ten three-hour, one-semester courses for the M.A. including one three-hour course registration for Thesis. The student normally takes four 300-level seminars, five other courses at the 100 and 200 levels, and Art 393, Thesis Registration. At least one course or seminar must be taken in each of the four major periods of art history: ancient, medieval, renaissance-baroque, and modern. Two of the three-hour one-semester courses are considered electives. These may be art history courses or courses in any area relevant to the student's study (with the permission of the director of Graduate Studies). If a student elects to do an external minor, the two elective courses are considered part of the minor. One additional elective is then necessary, making a total of eleven three-hour courses for the M.A.: eight in the history of art and a minimum of three in the external minor. An external minor is available, e.g., in Medieval Studies (see the end of the Classics entry), Renaissance Studies, American Studies, and other fields.

The M.A. candidate is expected to demonstrate proficiency in a romance language or German, normally within the first semester. Proficiency in a language is usually demonstrated by obtaining a passing grade on the UNC reading competency examination or by obtaining a satisfactory grade in the graduate reading courses offered by this University, e.g., French 102x, German 102x. Typically at the start of the fourth semester, following the completion of twenty-seven hours of graduate credit, the candidate takes the master's examination. Upon successful completion of the M.A. examination, the student prepares an M.A. thesis. 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, the student should notify the department of his or her intention at the time of the M.A. examination in order to allow a full evaluation of the student's 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.

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 Record or the Handbook. In addition to the courses completed for the M.A., doctoral students normally take at least four 300-level seminars in at least two fields of study, two additional courses in art history, two electives in art history or an outside discipline, and Art 394, Dissertation Registration. A studio field or an external minor may be offered, but either choice requires the completion of more courses. The candidate must have passed the reading examinations in a minimum of two foreign languages, generally a romance language and German; the student may be required to pass other language examinations for study in special fields. The doctoral written examinations cover three fields: a major field, a minor related to the major field, and an unrelated minor, all normally chosen from within the following: ancient, medieval, renaissance-baroque, modern and contemporary art and design, and African Art. 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 January 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). Hills.
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.
124 TOPICS IN FAR EASTERN ART (ASIA 124) (3). Lee.
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.
160 RENAISSANCE ART IN VENICE (3). Pardo.
161 BAROQUE ARCHITECTURE (3). Hills.
162 SIXTEENTH-CENTURY ITALIAN PAINTING (3). Pardo.
163 SIXTEENTH-CENTURY VENETIAN PAINTING (3). Pardo.
165 SIXTEENTH-CENTURY DUTCH AND FLEMISH ART (3).
171 ITALIAN BAROQUE PAINTING (3). Hills.
172 SEVENTEENTH-CENTURY FRENCH AND FLEMISH ART (3). Staff.
173 EIGHTEENTH-CENTURY FRENCH PAINTING (3). Sheriff.
174 ANTHROPOLOGY OF ART AND ARCHITECTURE (ANTH 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). Connor.
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.

251 GENDER AND VISUAL CULTURE (WMST 251) (3). Sheriff. Mavor.
276 ADVANCED READINGS TOPICS IN THE HISTORY OF ART (3).
294 GREEK TOPOGRAPHY (CLAR 294) (3).
296 ROMAN SCULPTURE (CLAR 296) (3).
297 ROMAN PAINTING (CLAR 297) (3).
298 ROMAN TOPOGRAPHY (CLAR 298) (3).
299 ETRUSCAN ART (CLAR 299) (3).
301 TOPICS IN THE HISTORY OF ART (3). Staff.
350 SEMINAR IN MEDIEVAL ART (3). Folda.
351 SEMINAR IN MEDIEVAL ART (3). Verkerk.
352 SEMINAR IN RENAISSANCE ART (3). Pardo.
354 SEMINAR IN BAROQUE ART (3). Hilla.
355 SEMINAR IN NINETEENTH-CENTURY ART (3). Sheriff.
356 SEMINAR IN AMERICAN ART (3). Marks, Harris.
357 SEMINAR IN MODERN ART (3). Mavor, Sheriff, Harris.
358 SEMINAR IN ANCIENT ART (CLAR 358) (3). Sturgeon.
378 SEMINAR IN MUSEUM STUDIES (3).
393 MASTER'S THESIS (3 or more).
394 DOCTORAL DISSERTATION (3 or more).
400 GENERAL REGISTRATION (0).

Studio Art

Courses for Graduates

230 GRADUATE STUDIO ART SEMINAR (2).
240 GRADUATE STUDIO (Var.).
250 GRADUATE CRITIQUE (3).
393 MASTER'S THESIS (3 or more).
400 GENERAL REGISTRATION (0).

DEPARTMENT OF BIOCHEMISTRY AND BIOPHYSICS

RONALD SWANSTROM, Acting 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 Cytoskeleton and Signal Transduction
*Charles W. Carter Jr. (19) Structural Molecular Biology, Protein Structure/Function, X-ray Crystallography of Proteins including Aminoacyl RNA Synthetases, Deaminases, Phasing Methods
*Stephen G. Chaney (25) Chemistry and Action Mechanism of Platinum Anticancer Agents, DNA Repair, Effects of DNA-Damaging Agents on Gene Expression
Marshall Edgell (14) Use of Biophysical and Genetic Techniques to Attack Various Problems Associated with Protein Engineering, High Affinity Protein/Protein Binding, Molecular Biology
*Beverly Errede (144) Function and Regulation of MAP-Kinase Activation Pathways in Saccharomyces cerevisiae
Donald T. Forman (38) Alcohol Metabolism, Ion Embryos of Metabolism, Biochemical Markers of Disease
Jack Griffith (41) Molecular Structure of Recombination Complexes, Electron Microscopy of DNA-Protein Complexes, HIV Replication
*Jan Hermans (46) Theoretical Approaches to Structure and Function of Proteins: Computer Modeling, Molecular Dynamics, and Molecular Graphics
*Barry R. Lentz (62) Biomembrane Structure and its Relationship to Function, Platelet Membranes in Blood Coagulation, Membrane Fusion, Liposomes
*Patricia F. Maness (68) Cell Adhesion and Signal Transduction in Nervous System Development
* core faculty member
Research Associate Professor
Lawrence M. Silverman (113) Clinical Applications of DNA Probes, Tumor Markers, CSF Markers of Demyelination, Clinical Enzymology

Adjunct Professors
Steven S.-L. Li (65) Molecular Biology, Protein Chemistry
George W. Lucier (66) Molecular Epidemiology and Application of Biochemical Approaches to Estimating Human Risks to Environmental Chemicals

Clinical Assistant Professor
Dianne M. Frazer (37) Inborn Errors of Metabolism, Newborn Screening, Nutrition

Professors Emeriti
Michael K. Berkut
Edward B. Glassman
William Henry Pearlman
Ralph Perlissi
Howard A. Schneider
George K. Summer
Robert H. Wagner
James R. White
John E. Wilson

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. and M.S. degrees. Modern research in biochemistry and biophysics utilizes chemical, physical, and molecular approaches. 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 three of the following five courses: Biochemistry 104, 105 (or Biochemistry 110), 108 (or Cell Biology 106), 134, or Physical Biochemistry Modules (BIOC 144-151, any three modules). In addition, all students take a special seminar course (Biochemistry 205) and select a minimum of three laboratory rotations (Biochemistry 207). These five 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 Examinations, which are in the format of NIH grant proposals. Students are also required to take electives (a minimum of nine semester hours credit) including at least two three-hour lecture courses. The remainder can be seminar or lecture courses. The electives may be courses offered either by the Department of Biochemistry 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 exempted from Biochemistry 104 upon completion of MEDI 120 (biochemistry for medical students) and are required to complete two of the following courses (six credit hours): Biochemistry 105 (110),
108 (Cell Biology 106), 134, Physical Biochemistry Modules (BI0C 144-151), as well as Biochemistry 205 (three credit hours), two rotations in Biochemistry 207 (four credit hours), and Biochemistry 212 (three 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. The department encourages students to select a primary faculty member as research sponsor; however, research opportunities with joint faculty members are available under special circumstances. After a research sponsor has been selected, a research guidance committee is formed to review the student’s progress at least yearly. The examinations required for admission to candidacy for the M.S. and Ph.D. degree are administered as written research grant proposals. The Ph.D. candidate writes two such proposals: one on the chosen research project and a second in an area removed from the thesis. Site visits are conducted to allow the student to defend the grant proposals. The M.S. candidate writes one proposal on the chosen research project to be approved by the student’s research guidance committee. The most important requirement for both the M.S. and Ph.D. degrees is a dissertation of original research carried out independently by the candidate. The M.S. and Ph.D. candidates are each 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 fellowships and teaching or research assistantships. More than forty graduate students are currently registered in the department. In 1997, students received a stipend of $17,480 (for the twelve months); the stipend usually increases yearly. 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, calculus, and physical chemistry. It is anticipated that students who have not had these courses will take them, as appropriate, after their arrival. Application forms for admission as well as information about the department may be obtained from the director of graduate studies in Biochemistry.

Research Interests

The faculty research interests are diverse and include research in the following areas: molecular biology, molecular genetics, neurological development in Drosophila and transgenic mice; biochemistry and genetics of bacteria, yeast, Drosophila and mammals; membrane structure and function; neurochemistry; physical biochemistry including fluorescence and NMR spectroscopy, X-ray crystallography, and molecular modeling; tubulin assembly; cell sorting of proteins essential for subcellular structures; enzyme mechanisms and protein structure; biochemical action of genotoxic and cytotoxic agents; cancer and RNA tumor viruses, RNA metabolism, DNA-protein interactions, and protein engineering. More detailed information concerning the research publications of our faculty is available in the American Chemical Society's Directory of Graduate Research. A brochure describing the department can be obtained by writing to the director of graduate studies of the Department of Biochemistry and Biophysics.

Facilities

The departmental research facilities are on three floors of 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 instruments for structural, biophysical, biochemical, and molecular biological 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 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 core 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 (Chemistry 133) (3). Prerequisite, Chemistry 130 or equivalent. Focuses on enzyme architecture to illustrate how the shapes of enzymes are designed to optimize the catalytic step and become allosterically modified to regulate the rate of catalysis. Spring. Traut, Weeks, Wolffenbender.

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

108 CELLULAR MEMBRANES (3). Prerequisite, Chemistry 130 or equivalent. Cellular organization, structure of lipids and membrane proteins and their interactions; transport systems; biogenesis, membrane fusion and traffic; cytoskeletal protein-membrane interactions; transmembrane signaling. Fall. Meisner, Erickson, Errede, Lentz.

110 ADVANCED MOLECULAR BIOLOGY I (Microbiology 108) (Genetics 110) (Pharmacology 136) (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, Maccon, 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. Fried, Baldwin, Marzluff.

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, function, and transformation. 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. Meissner, 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 enzymology. Spring. Carter.

139 HORMONES AND EVOLUTION (Biology 139) (2). Prerequisites, Chemistry 130, Biology 52, or Biology 50 or equivalent. An introduction to the chemistry of hormones and the biochemical mechanisms underlying their biological actions in evolutionary perspective with emphasis on unifying concepts. Spring. Pearlman.

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

144 BASIC CONCEPTS MODELS IN BIOPHYSICS (1). Prerequisites, Chemistry 130 and two semesters of physical chemistry or permission of instructor. Review of mathematical methods and models for describing macromolecules: noncovalent and covalent forces; statistical thermodynamics; molecular dynamics simulations; water as a solvent. Fall. Lenz.

145 DYNAMICS OF MACROMOLECULES (1). Prerequisites, Chemistry 130 and two semesters of physical chemistry or permission of instructor. Application of basic physical concepts to prediction of the properties of biological macromolecules using modern computational methods. Fall. Hermans.

146 ASSEMBLY/LABILITY OF MACROMOLECULAR COMPLEXES (1). Prerequisites, Chemistry 130 and two semesters of physical chemistry or permission of the instructor. Macromolecular diffusion and friction; thermodynamics of macromolecular systems: linkage of conformation change, ligand binding and self-assembly; order/disorder transitions in macromolecular structure. Fall. Hermans.

147 SPECTROSCOPY: PRINCIPLES AND APPLICATIONS (1). Prerequisites, Chemistry 130 and two semesters of physical chemistry or permission of the instructor. Principles of UV, IR, Raman, fluorescence, and spin-resonance spectroscopies; applications to the study of macromolecules and membranes. Spring. Lenz.

148 STRUCTURE AND DYNAMICS OF BIOMOLECULES IN SOLUTION (1). Prerequisites, Chemistry 130 and two semesters of physical chemistry or permission of the instructor. Principles and practice of nuclear magnetic resonance spectroscopy; applications to biological macromolecule structure and dynamics in solution. Spring. Campbell.

149 X-RAY CRYSTALLOGRAPHY OF MACROMOLECULES (1). Prerequisites, Chemistry 130 and two semesters of physical chemistry or permission of the instructor. Principles of protein crystallography; characterization of crystals; theory of diffraction; phasing of macromolecular crystals and structure refinement. Spring. Ke.

150 IMAGING MACROMOLECULAR ASSEMBLIES (1). Prerequisites, Biochemistry 144-147 or permission of the instructor. Application of electron microscopy, scanning force microscopy, and optical microscopes (fluorescence and confocal) to examining the organization and motions of macromolecules in cells. Spring. Salmon, Jacobson, Costello, Lentz (coordinator), and others.

151 MACROMOLECULAR INTERACTIONS (1). Prerequisites, Biochemistry 144-147 or permission of the instructor. 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. Lombardo, Lentz (coordinator).

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. Fall and spring. Staff (coordinator); Caplow (director); Spring.

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

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 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.

211 RESEARCH CONCEPTS IN BIOCHEMISTRY (3). 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. Spring. 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. Spring. Sancar (course director), staff.

222 CELLULAR AND MOLECULAR NEUROBIOLOGY I
(Neurobiology 222) (3-5). Prerequisite, permission of the instructor. 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. Neurobiology faculty, including Morell.

223 CELLULAR AND MOLECULAR NEUROBIOLOGY II
(Neurobiology 223) (2-3). Prerequisite, permission of the instructor. 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. Neurobiology faculty, including Morell.

The following seminar courses are designed for students majoring or minoring 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. Seminar courses provide teaching experience, which is required for a graduate degree in Biochemistry and Biophysics. In addition, the courses provide experience in giving a critical review of the current literature.

230 SEMINAR IN MEMBRANE STRUCTURE AND FUNCTION (2). Prerequisites, Biochemistry 108 and permission of the instructor. Students organize and present in-depth seminars in selected areas of modern membrane research. Spring. (1999 and alternate years.) Lentz, Meuser.

235 SEMINAR IN CHEMICAL NEUROBIOLOGY (Neurobiology 235) (2). Prerequisites, two semesters of biochemistry. Fall. (1999 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.

242 SEMINAR IN CLINICAL BIOCHEMISTRY (2). Prerequisite, permission of instructor. Current topics in clinical biochemistry including analytical methodologies and clinical interpretation. Summer, Silverman.

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. Isomorphous replacement, multiple wavelength anomalous scattering, and Bayesian direct methods are covered. One two-hour seminar a week. Spring. (1999 and alternate years.) Carter.

245 SEMINAR ON CELL SIGNALING (2). Prerequisite, two semesters of biochemistry. Signal transduction in embryonic development. Spring. (1999 and alternate years.) Maness.

250 SEMINAR IN BIOCHEMISTRY OF THE CYTOSKELETON (2). Prerequisites, two semesters of biochemistry. One two-hour seminar a week. Spring. (2000 and alternate years.) Caplow.

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, regulation, recombination, and repair. Spring. (1999 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 classic and recent literature are discussed. Spring. G. Sancar.

256 SEMINAR ON CURRENT TOPICS IN MOLECULAR BIOLOGY (Genetics 256) (2). Prerequisite, Biochemistry 105, 110, or equivalent. Review of current literature on molecular biology with particular emphasis on gene therapy, inherited diseases, virology, and cancer. Spring. (1999 and alternate years.) Vos.

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. Lentz, 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. Troshpa (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. Troshpa (coordinator); staff.

301, 302 RESEARCH IN BIOCHEMISTRY (3 or more). Prerequisite, permission of the 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 (0 or more). Staff.

394 DOCTORAL DISSERTATION (0 or more). Staff.

400 GENERAL REGISTRATION (0).
DEPARTMENT OF BIOLOGY*

ALAN FEDUCCIA, Chair

Professors
Kerry S. Bloom (39) Molecular Genetics
W. E. Bollenbacher (38) Invertebrate Neuroendocrinology
William C. Dickson (43) Plant Morphology and Anatomy
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
Mark E. Hay (70) Marine Community Ecology
William F. Marzluff (66) Transcriptional and Posttranscriptional
  Regulation of RNA Metabolism, Cell Cycle Regulation during Development
Ann G. Marthysse (52) Molecular Biology and Plant Pathology
Steven W. Matson (63) Molecular Biology and Biochemistry
Clifford R. Parks (56) Plant Systematics and Genetics
Robert K. Feit (57) Plant Ecology
Charles H. Peterson Marine Ecology
Thomas D. Petes (77) Yeast Genetics
John R. Pringle (84) Cell Biology and Yeast Genetics
Ralph S. Quatrano (80) Plant Development
Edward D. Salmon (34) Cell Biology
Tom K. Scott (60) Plant Physiology
Darrel W. Stafford (17) Developmental Biochemistry
Alan E. Stiven (18) Population and Community Ecology
Peter S. White (72) Plant Ecology
R. Haven Wiley (20) Animal Behavior

Associate Professors
Albert S. Baldwin (81) Immunoglobulin Gene Expression
Victoria L. Bauch (79) Molecular Basis of Development
Jeffrey L. Dangl (87) Generic and Molecular Analysis of Disease Resistance
Alan M. Jones (71) Plant Cell Biology
William M. Kier (67) Functional Morphology of Invertebrates, Biommechanics
Kenneth J. Lohmann (83) Neuroendocrinology and Invertebrate Zoology
Donald W. Misch (12) Cell Biology and Electron Microscopy
Gustavo P. Maron (33) Molecular Genetics of Drosophila
Mark A. Peifer (85) Developmental Genetics
Patricia J. Pukkila (35) Molecular Genetics
Seth R. Reice (14) Community Ecology, Stream Ecology
Lillie L. Searles (68) Molecular Biology

Assistant Professors
Ann Burke (90) Development in Evolution of Vertebrates
Robert Darrow (92) Cell Cycle Control during Drosophila Development
Robert D. Podolsky (94) Ecology and Evolution
David Pfennig (91) Ecology and Evolution
Jason W. Reed (88) Light Signal Transduction in Plants

Associated Faculty
Wayne W. Litsker, Molecular Biology
Jennings R. Massey (51) Plant Systematics
Rogers McGaugh (54) Plant Systematics
Gary Wineberger, Reproductive and Developmental Toxicology

Professors Emeriti
Edward G. Barry
C. Ritchie Bell
Aristotle J. Donnus
Nelson G. Hairston
Max H. Hommesand
Claiborne S. Jones
William J. Koch
H. Eugene Lehman
Elizabeth A. McMahen
Helmut C. Mueller
Albert E. Radford
Maurice Whittinghill

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 neuroendocrinology, and developmental and membrane functions in plant systems).

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

- Ecology and Behavior, including (1) ecology and population biology (life histories, population, community, and ecosystems 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).

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

*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.
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 textbooks, 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 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.

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 assistants 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 Scholarship is awarded annually to support summer research of students in botany. It is a nonservice award.

The William Chambers Coker Fellowship is awarded annually to a student or students in the final years of work 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 botany. 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, Scott.

103 INTRODUCTION TO PLANT TAXONOMY (4). Prerequisite, Biology 11, 11L. Introduction to the taxonomy of vascular plants. Principles of classification, identification, nomenclature, and description. Laboratory and field emphasis on phytogeography, families, description, identification, and classification of vascular plant species. Three lecture and three laboratory hours a week. Fall. Massey.

104 VERTEBRATE EMBRYOLOGY (3). Prerequisite, Biology 45 or 52. Principles of development including gametogenesis, fertilization, cleavage, germ layer formation, organogenesis, and techniques of experimental analysis of developmental processes. Three lecture hours a week. Fall or 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. Fall or spring. Harris.

105 INVERTEBRATE ZOOLOGY (4). Prerequisites, Biology 11, 11L, and one additional course in biology. An introduction to the major invertebrate phyla, emphasizing the morphology, behavior, classification, and ecology of marine invertebrates. Three lecture and three laboratory hours a week. Spring. Lohmann.

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. Matthysse.

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. Spring. Matthysse.
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, regulons, plasmids, transformations and conjugation. Spring. Matthysse.

110 INVERTEBRATE PALEONTOLOGY (4). Prerequisite, Geology 16 or Biology 11, or permission of the instructor. A survey of the major invertebrate phyla represented in the geologic record, with emphasis on broad skeletal morphology, evolutionary trends, ecology, and biostratigraphic significance. Three lecture and two laboratory hours a week. Fall. Carter.


112 PLANT PHYSIOLOGY (4). Prerequisites, Biology 11, 11L. A general introductory study of the life processes of plants including photosynthesis, energy relations, biosynthesis and biochemical regulation, movement of materials, growth, and differentiation. Three lecture and three laboratory hours a week. Spring. Scott.

113 MARINE ALGAE (MASC 113) (4). Prerequisites, Biology 11, 11L. Structure, reproduction, systematics, and ecology of marine algae. The laboratory includes field studies. Two lecture and four laboratory hours per week. Spring. Hommersand.

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 avifauna. 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 1 or 2 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 major host-microbe strategies such as symbiosis, parasitism, commensalism, and mutualism. Evolutionary, cellular and molecular aspects will be explored. Spring. (Alternate years.) Dangl.

120 COMPARATIVE PHYSIOLOGY (3). Prerequisites, Biology 11, 11L, and one course in physiology recommended. An examination of the physiology of animals using a comparative approach. Both vertebrate and invertebrate physiology are included, with an emphasis on "whole-animal" physiology. Fall or spring. Kier.

121 INTRODUCTION TO NEUROPHYSIOLOGY (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. Spring. Maroni.


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. 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 instructors. Introduction to mechanisms of evolutionary change, including natural selection, population genetics, history and evolution of speciation, and micro- and macro-evolutionary trends. Three lecture hours plus two hours of laboratory/recitation per week. Fall. Burke and Pfennig.

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, hemophilia, thrombophilia, atherosclerosis, and viral infections. Fall. Church.

135 TAXONOMY OF SPECIAL GROUPS OF NONVASCULAR PLANTS (2 - 6). Prerequisite, Biology 51. Field and laboratory identification and classification of special groups of nonvascular plants: 135a Aquatic Phycomycetes; 135b Marine Fungi; 135c Fleshy Fungi; 135d Mycetozoa; 135e Marine Algae; 135f Freshwater Algae. Nine laboratory hours a week. Fall and summer. Staff.

139 HORMONES AND EVOLUTION (Biochemistry 139) (2). Prerequisite, Chemistry 130 or Biology 50 or 52 or equivalent. An introduction to the chemistry of hormones and the biochemical mechanisms underlying their biological actions in an evolutionary perspective with emphasis on unifying concepts. Spring. Pearlman.

140 BIOLOGICAL OCEANOGRAPHY (Marine Sciences 104; Environmental Sciences 136) (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. 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 microbes (Kohlmeyer, Pearl), marine ecology (Hyn, 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.) Fees.

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. Spring. (Alternate years.) Fees.

144 DEVELOPMENTAL BIOLOGY (3). Prerequisites, Biology 50, 52 and Chemistry 61. 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. Bautch, Pfefter, Quatrano, Reed.

145 EXPERIMENTAL METHODS IN ECOLOGY AND EVOLUTION (3). Prerequisite, Biology 54. Quantitative and experimental approaches in ecological and evolutionary research including the construction of hypotheses and the corresponding experimental designs and analyses. Discussion of specific experiments in population, community, and evolutionary ecological research. Three lecture hours per week. Spring. (Alternate years.) Stiven.

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.) Hay, 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. Fall or 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. Fall or spring.

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. (Alternate years.)

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.


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. Dickison, Genzel.

154 NEUROETHOLOGY (3). Prerequisite, 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. Fall. (Alternate years.) Lohmann.

155 COMPARATIVE BIOMECHANICS (3). Prerequisites, Biology 11, 11L, Physics 24 and 25 recommended. Principles of fluid and solid mechanics applied to a variety of biological systems. Both invertebrates and vertebrates are included. Fall. Kier.

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. Fall. Fediuccia.

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. Bautch, Reed.

161 PRINCIPLES OF GENETIC ANALYSIS (GEN. 112) (3). Prerequisites for undergraduates, Biology 53 and permission of instructor; for graduate students, an undergraduate genetics course or permission of instructor. Principles of genetics and genetic analysis in eukaryotes and prokaryotes. Fall. Petes, Pringle.

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. Parks, staff.

164 MOLECULAR BIOLOGY (3). Prerequisites or corequisites, Chemistry 61 and Biology 50. Emphasis is on prokaryotic molecular biology, plasmids, phage, and single-strand phages. Three lecture hours a week. Spring. Marzluff, Searles, Stafford.

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. Kay, Quatrano.

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. Spring. 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.

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, Matson, 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, Kole.

181 PALEOBOTANY (Geology 197) (4). Prerequisites, Biology 11-11L 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. Spring. 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. Fall or spring. (Alternate years.) Svenen.

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. Fall or spring. (Alternate years.) Svenen.

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. Fall or 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. Fall or spring. Reice.

189 NUCLEIC ACID TECHNIQUES (Biochemistry 189, Genetics 189, Physiology 189) (4). Prerequisite, permission of the instructor. An intense two-week hands-on course covering recombinant DNA technology. Fee required; some scholarships available. Eight laboratory hours. Fall, spring, or summer. Marzluff.

190 FRONTIERS IN BIOMOLECULAR SCIENCE (3). Prerequisites, two courses in biology and permission of the instructor. Does not count toward a major in biology. Fall.

195-FIELD BIOLOGY AT HIGHLANDS BIOLOGICAL STATION (1-4). Prerequisite, Biology 11 or equivalent or permission of the instructor. Content varies. Summer field biology at the Highlands Biological Station focuses generally on the special faunal and floras 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

207 INTRODUCTION TO NEUROBIOLOGY (Neurobiology 107) (3). Prerequisites, one course in biological science and permission of the director of the neurobiology program. Topics considered include organization of the nervous system; neurochemistry; neurophysiology; neuropharmacology; neurogenetics; computers. Three lecture hours a week. Fall. (Alternate years.) Staff, Neurobiology Curriculum.

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 of 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.

218 EXPERIMENTAL ENDOCRINOLOGY (Neurobiology 218) (2). Prerequisite, permission of the instructor. A survey of hormonal and neural mechanisms in vertebrates and invertebrates; the comparative anatomy and physiology of neurons and functional units of nervous systems; endocrine structure, function, and mode of hormone action. Six laboratory hours a week. Spring. (Alternate years.) Staff, Neurobiology Curriculum.

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.) Dickson, Massey.

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.) Dickson, Massey.

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.) Dickson.


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. Harris, Misch, Salmon.

255 SEMINAR IN ECOLOGY (2). Prerequisite, Biology 54 or permission of the instructor. May be repeated for credit. Fall or spring. Peet, Reice, Sivin, 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.

257 SEMINAR IN VERTEBRATE EVOLUTIONARY BIOLOGY (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall or spring. Ficoccia.

259 SEMINAR IN COMPARATIVE ANIMAL BEHAVIOR (Neurobiology 259) (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall or spring. Peet, Reice, Sivin, White.

260 SEMINAR IN COMPARATIVE PHYSIOLOGY (Neurobiology 260) (2). Prerequisite, Biology 120 or permission of the instructor. Fall or spring. Staff.

262 SEMINAR IN PHYSIOLOGY (2). Permission of the instructor or research director. Fall and spring. Hommersand.

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.

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. Hommersand, Matthysse, Scott.

268 SEMINAR IN CELL BIOLOGY AND BIOCHEMISTRY (2). Prerequisite, permission of the instructor or research director. Fall and spring. Gilbert.

269 SEMINAR IN PLANT SYSTEMATICS (2). Prerequisite, permission of instructor or research director. Fall and spring. Dickison, Gensel, Parks, Massey.

270 SEMINAR IN GENETICS (2). Prerequisite, permission of the instructor. May be repeated for credit. Fall and spring. Maroni, Petes, Peifer, Pukkila.

271 SEMINAR IN PLANT MORPHOLOGY AND ANATOMY (2). Prerequisite, permission of research director. Fall and spring. Dickison, Gensel.

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. Jones, Quatrano.

275 GENETICS SYSTEMS (Genetics, Microbiology, Biochemistry 275) (1). A course to provide public lecture experience to advanced genetics students. Students present personal research seminars based upon 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 PALYNOLGY (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.) Gensel.

290 SEMINAR IN NEUROBIOLOGY (Neurobiology, Neurophysiology, Pathology, Pharmacology, and Physiology 290) (3). Prerequisite, one graduate course in the biological sciences and permission of the instructor. Three lecture hours a week. Fall and/or spring. Staff of 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, Griffiths, 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, Gilbert, Harris, Kay, Misch, Salmon.

301 RESEARCH IN ECOLOGY (2 or more). Peet, Reice, Sivin, White, Wiley.

302 RESEARCH IN NEUROBIOLOGY (Neurobiology 310; Neurobiology, 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). Burke, Gilbert, Harris, Kay, Bautch.

305 RESEARCH IN GENETICS (Genetics 305) (2 or more). Barry, Bautch, Maroni, Matthysse, Matsu, Petes, Pukkila, Searles.

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, Faby, Peterson, Schwartz.

308 RESEARCH IN MOLECULAR BIOLOGY (2 or more). Bloom, Bauch, Gilbert, Kay, Stafford.

309 RESEARCH IN PHYSIOLOGY: CELLULAR, COMPARATIVE, NEUROPHYSIOLOGY (2 or more). Bollenbacher, 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.

312 RESEARCH IN PHYCOLOGY (2 or more). Fall and spring. Hommsand.

313 RESEARCH IN PLANT PHYSIOLOGY (2 or more). Fall and spring. Matthysse, Scott.

314 RESEARCH IN PLANT MOLECULAR BIOLOGY (2 or more). Fall and spring. Dangl, Quatrano, Reed.

316 RESEARCH IN PLANT SYSTEMATICS (2 or more). Fall and spring. Massey, Parks.

317 RESEARCH IN PLANT MORPHOLOGY AND ANATOMY (2 or more). Fall and spring. Dickson, 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.

400 GENERAL REGISTRATION (0). Students in residence receiving stipendia and not otherwise registered must sign up for this number.

DEPARTMENT OF BIOMEDICAL ENGINEERING

CAROL L. LUCAS, Chair

Professors

*John E. Hammon (28) Medical Informatics with Emphasis on Clinical Databases, Physician Workstations, Computer System Integration and Applications in Laboratory Medicine

*Jacob S. Harker (40) Alloplastic Biomaterials for Bone and Nerve Repair or Drug Delivery, Assessment of Implant Health and Stability, Micrometric Image Analysis for Disease Diagnosis

*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 Newborn and Infants

Stephen M. Pizer (23) Medical Image Processing, Three-Dimensional -Display Techniques

*Benjamin M. W. Tsui (34) Medical Imaging Especially in the Areas of Single-Photon Emission Computed Tomography (SPECT) and Magnetic Resonance Imaging (MRI)

Barry Whitel (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

Richard P. Buck (45) Charge Transport in Ionic and Mixed Conductors, Membrane Systems, Ion Selective Electrodes and Biosensors

Edward Chaney (101) Image Acquisition Processing and Analysis for Radio Therapy Treatment Planning

Lester Kwock (30) Magnetic Resonance Imaging or Nuclear Magnetic Resonance Imaging and Spectroscopy Disease

Paul R. Moran (26) Medical Imaging, MR Flow Imaging, MR Phase Contrast Angiography

Julian Rosenman (102) 3D Medical Imaging in Reconstruction

Associate Professor

*Henry S. Hsiao (3) Medical Instrumentation, Interfacing Microprocessors to Physiological Transducers, Telemedicine

Adjunct Associate Professors

James Brickley, Computer Monitoring and Control of Human Motion, Development of Digital Control for Machines Designed to Evaluate/Rehabilitate Muscular Deficits

William Krakow, Simulation and Verification of Chip Architecture for Electrocardiogram Data Compression

Robert Rutledge, Clinical Outcomes, Illness Severity Assessment, Medical Databases

Barbara Wildermuth, Adoption and Use of Information Technologies, Information-Segregating Behaviors and Information Use, Design and Evaluation of Information Systems

Research Associate Professors

*Timothy A. Johnson (46) Cardiac Electrophysiology, Biomedical Instrumentation, Biosensors and Control Theory

*Stephen R. Quin (29) Signal Processing, Systems Analysis, Optimal Ventilation of Neonates

Assistant Professors

*Steven M. Downs (39) Decision Analysis and Its Applications in Clinical Guidelines Development and Computer-Based Medical Decision Support Systems

*Oleg Favorov (31) Somatosensory Cortical Physiology and Neural Network Modeling of Cortical Information Processing

*Eric Frey (35) Nuclear Medicine Imaging, Corrective Reconstruction Techniques in Emission Computer Tomography, Application of High-Speed Computers to Image Reconstruction

*Jeff Thompson, Dental Materials, Fracture Mechanics, Atomic Force Microscopy

*Mark Tommerdahl (48) Somatosensory Cortical Dynamics and Neurocomputations in Living Neural Networks, Methods for Acquisition and Analysis of Neurophysiology

Research Assistant Professors

*Ruth de Biekel (25) Clinical Decision Support Via Computer, Clinical Reasoning And Problem Solving

*Dan Fritsch (49) Medical Informatics

Belinda Ha, Pulmonary Input Impedance, Pulmonary Artery

David L. Lulash (36) Nuclear Medicine Imaging, Tomographic Reconstruction Algorithms, Medical Image Processing, Three-Dimensional Medical Image Display...*  

John W. Loosk (32) Medical Informatics, Medical Information Delivery, Medical Information Management, Medical Education, Information Technology, Clinical Decision Support

* basic teaching faculty
Adjunct Assistant Professors
Patricia A. Michael (27) Clinical Information Systems and Medical
Databases, Hypermedia Applications in Medicine, Unified Medical
Language System Project (NLM)
Jonathan A. Marshall (103)

Instructor
Paul Weinhold
Professors Emeriti
N. A. Coulter Jr.
Richard N. Johnson
Lloyd R. Yonce

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 biostatistics, 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, and has a track in medical informatics. The Department of Biomedical Engineering enjoys close working relations with the departments of Computer Science, Neutology, Physics, Physiology, and Radiology; the Dental Research Center; and the School of Engineering at Raleigh. 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

There is no fixed set of requirements for entrance into this program. 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.

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. Applicants with M.D.'s are qualified for admission into the medical informatics track.

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

†100 INTRODUCTION TO BIOMEDICAL ENGINEERING (1). 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, Biomedical Engineering 120, Math 128 or equivalent 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. (On demand). Staff.

103 BIOELECTRIC PHENOMENA (3). Prerequisites, Physics 27, Biomedical Engineering 111, 120, and 132 or equivalent and permission of the instructor. Fundamental principles of electromagnetism, biologically exemplified, are presented. Circuit models and volume conductor theory are applied at all biological levels. Minicomputer simulations are used to demonstrate bioelectric properties. (On demand.) Johnson.

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. Quint.

107 INFORMATION, MODULATION, TRANSMISSION, AND NOISE (3). Prerequisites, Physics 101 and permission of the instructor. Physics and network models of active devices. Active filter design and applications to communication systems including information theory. Spring. Quint.

†111 BIOMEDICAL INSTRUMENTATION I (3). Topics include basic electronic circuit design, analysis of medical instrumentation circuits, physiologic transducers (pressure, flow, bioelectric, temperate, and displacement). This course includes a laboratory where the student builds biomedical devices. Spring. Hsiao, Johnson.

†112 BIOMATERIALS (3). Prerequisite, Physiology 140 or one year college-level biology. 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. Kusy.

†120 REAL-TIME COMPUTER APPLICATIONS I (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. Frisch, Lalush, Quint.

†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.

† core curriculum courses
128 ANALYSIS AND SYNTHESIS OF DIGITAL SYSTEMS (3). Prerequisites, Physics 101 and 102, and permission of the instructor. Application of Boolean algebra to the analysis and synthesis of switching circuits; techniques of minimizing Boolean functions; number systems; arithmetic operations; threshold logic; asynchronous machines. Fall. Quaint.

129 DIGITAL SYSTEM DESIGN AND APPLICATIONS (3). Prerequisite, Biomedical Engineering 128. Provides a thorough grounding in the use of semicustom CMOS gate arrays to implement both analog and digital functions. Computer aided design tools are employed for circuit design and modeling, automatic test pattern generation, fault simulation, and design for testability. (On demand.) Staff.

132 LINEAR CONTROL THEORY (3). Prerequisite or corequisite, Math 128 or equivalent. Linear control system analysis and design are presented. Frequency and time domain characteristics and stability are studied. 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, Lalush.

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, Lalush.

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. Spring. Thompson.

170 INTRODUCTION TO MEDICAL INFORMATICS (3). A survey of current topics in medical informatics including: patient data collection and presentation, medical information storage and retrieval, hospital and medical information systems, medical records, CAI, and MD assistance programs. Fall. (Alternate years.) Hammond.

171 MEDICAL INFORMATION SYSTEMS (3). Introduction to database construction, including entity-relationship diagrams with emphasis on issues raised by medical information. Special attention to issues of system reliability, data security, and to images and other non-traditional data types. Spring. Frisch.

181 INFORMATION PROCESSING IN THE SOMATOSENSORY NERVOUS SYSTEM: EMPIRICAL AND THEORETICAL FOUNDATIONS (3). Prerequisite, introductory graduate-level course in mammalian physiology - e.g., Physiology 140 (may be taken concurrently). This course reviews and discusses (a) the strengths and limitations of the methodologies and approaches that have been used by experimentalists to evaluate information processing and representation in the somatosensory nervous system, and (b) the neural mechanisms currently believed to underlie the somatosensory capacities of humans. Fall. Whitset.

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. Hsiao.

212 ADVANCED BIOMATERIALS (3). Prerequisite, Biomedical Engineering 112 or permission of the instructor. Each week a medical or dental implant or explant is highlighted from a textbook, the scientific literature, and personal accounts. Spring. Kuri.

220 REAL-TIME COMPUTER APPLICATIONS II (3). Prerequisites, Biomedical Engineering 120, 111. Problems of interfacing computers with biomedical devices and systems are studied. Students collaborate to develop a new biomedical instrument. Projects have included process control, data acquisition, disk system interfaces, and telemedicine. Spring. Hsiao.

222 HEMODYNAMICS (3). Prerequisites, Biomedical Engineering 102 and Physiology 140 or equivalents. The dynamics of blood flow in blood vessels 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 signals are presented, including signal characterization, pattern recognition, and parameter estimation. Examples from biomedical literature are studied. Spring. Quaint.

230 NUMERICAL METHODS FOR BIOMEDICAL ENGINEERING (3). Prerequisites, Math 83, Biomedical Engineering 120, or experience in C 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. 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 laptop devices. (On demand.) Quaint.

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. (Alternate 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. (Alternate years.) Lucas.

251 DIGITAL X-RAY IMAGING (3). Prerequisites, Biomedical Engineering 141, 142. Advanced topics of physics and instrumentation in digital X-ray imaging techniques treated with emphasis on digital radiography and computed tomography. Fall. Staff.

252 DIGITAL-NUCLEAR-IMAGING (3). Prerequisites, Biomedical Engineering 141, 142. Advanced topics of physics and instrumentation in nuclear imaging and magnetic resonance techniques. Spring. (Alternate years.) Tsui.

* cross-listed with Neurobiology, Oral Biology, Physiology, and Psychology.
253 ADVANCED MEDICAL IMAGE PROCESSING (3).
Prerequisities, 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. Fall. (Alternate years.) Tsui.

259 IMAGE PROCESSING ANALYSIS (COMP 254) (3).

260 BIOMATERIALS INSTRUMENTATION (3).
Prerequisite, Biomedical Engineering 160 or permission of the instructor. Within laboratory environment the fundamental or engineering properties of various biomaterials are evaluated. Scientific methodology, data analysis, and technical report writing are stressed. Spring. Kusy.

270 RESEARCH AND EVALUATION METHODS IN MEDICAL INFORMATICS (3).
Prerequisite, Biomedical Engineering 170. An introduction to the empirical literature of informatics and an intensive immersion into the design and execution of studies. Spring. Downs.

271 CLINICAL REASONING AND DECISION MAKING (3).
Clinical reasoning and decision making under uncertainty are examined normatively and psychologically. Topics include: probability, Bayes' theorem, decision analysis, utility theories, and cognitive reasoning processes in decision making. Fall. Downs, de Bieck.

281 INFORMATION PROCESSING IN THE SOMATOSENSORY NERVOUS SYSTEM: MODELING AND SIMULATIONS (3).
Prerequisite, Biomedical Engineering 181. This course reviews and provides students direct experience with different classes of neural networks as models of structural development, stimulus-related dynamics, and information processing by both individual neurons and large, complex interconnected neuronal assemblies. Principal emphasis is on the organization and functions of cerebral cortex and cerebral cortical neurons. Spring. Favorov, 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 occurs as a function of stimulus properties, pharmacological manipulations, and other factors that dynamically modify the functional status of the network. Spring. Kelly.

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.

400 GENERAL REGISTRATION (0).

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
Thomas Scott Bateman (116) Individual Behavior in Organizations, Managerial Decision Making
Barry L. Bayus (131) Marketing Research, Technology Changes, Product Management
Richard A. Bettis, Strategic Management, Global Competition
Technologic Innovation, Strategic Change
Edward Joseph Blocher (61) Auditing, Management Accounting
Paul N. Bloom (93) Public Policy, Nonprofit Marketing, Marketing Professional Services
Julie Haney Collins (5) Federal Income Taxes, Tax Compliance, Effect of Taxes on Individual Behavior
Jennifer S. Conrad (107) Market Constraints, Stocks and Options
Jeffrey R. Edwards (160) Person-Organization Fit, Work-Family Issues
Doug Allen Elvers (18) Production/Operations Management, Scheduling, Project Management
John Parkhill Evans (20) Operations Research, Mathematical Programming
David James Harrzell (16) Mortgage Bank Securities, Real Estate Investment, Finance
John Dale Kasarda (32) Business Globalization, Privatization, Job Creation
Wayne R. Landsman (58) Financial Reporting Capital Markets
Richard Allan Mann (37) Legal Studies, Regulation of Business, Business Ethics
Richard Wolcott McEnally (38) Investments, Business Finance, Investment Banking
Curtis Perry McLaughlin (39) Production of Services, Professional Productivity, Management of Nonprofit Organizations
Alan William Neebe (41) Resource Allocation, Integer Programming, Facility Location, Computer Reliability
Ellen Rust Peirce (4) Legal Studies, Labor Law, Government Regulations
William Daniel Perreault Jr. (62) Industrial Marketing, Marketing Research Methods, Marketing Strategy
John Julius Pringle (43) Financial Management
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
Debra L. Shapiro (120) Organizational Behavior, Negotiation, Conflict Management
Rollie Tillman (51) Marketing Management, Corporate Strategy, Entrepreneurial Ventures
Bar I. Victor (12) Management, Organization Design, Organization Culture
Harvey M. Wagner (64) Management, Modeling
Associate Professors
Richard Stanley Blackburn (81) Organizational Behavior, Organizational Research Methods, Philosophy of Organizational Science
Linda Carolyn Bowen (9) Financial Accounting, Taxation, Auditing
Andrew C. Boynton (139) Information Technology Management, Process Management, Strategy
Joseph Henry Bylinski (83) Financial Accounting, Auditing
Robert A. Connolly (127) Foreign Currency Markets, Empirical Investments, Capital Markets
James W. Dean (158) Quality Management, Strategic Decision Making, Organizational Cynicism
Nicholas Michael Dillow (15) Consumer Behavior, Marketing Research Methods, Evaluation Research
Mustafa N. Gultekin (106) Portfolio Theory, Asset Pricing Models, Corporate Finance
John R. M. Hand (126) Financial Accounting, Capital Markets, Market Efficiency
Stuart Hart (163) Environmental Management
J. Morgan Jones (19) Quantitative Consumer Models, Bayesian Decision Theory
Charlotte H. Mason (108) New Product Evaluation, Diffusion of Innovation, Marketing Research Methodologies
Hugh M. O'Neill (131) Corporate Strategy, New Ventures, Turnaround Situations
Ronald Thomas Pannesi (105) Manufacturing Strategy, MRP II, JIT, Quality
Aleda V. Roch (130) Strategic Decision Making, World Class Manufacturing, Service Quality
Albert H. Segars (152) Telecommunications Management, Impact of Technology, Corporate-Level Planning for Information Technology
Henri J. Servaes (135) Corporate Finance, Corporate Control, Corporate Governance
Marc Zeruner (94) Corporate Governance, Corporate Finance, International Finance

Assistant Professors
Dong-Hyun Ahn (149) Finance
Sylvia S. Black (150) Strategic Management
Daniel Cable (154) Human Resources Management Selection, Recruitment, Compensation
Laura B. Cardinal (155) Innovation, Control Systems and Strategy Implementation
Kyle D. Cattani (156) Production Planning, Supply-Chain Management, Demand Forecasting
Pierre Chandon (157) Sales Promotion, Product Consumption, Consumer Behavior, International Marketing
Brian A. Cicchetti (141) Finance Real Estate Markets
Geraldo Ferrer (161) Remanufacturing, Reverse Logistics, Product Recovery
Bin Gao (151) Finance
Wendell Gillard (162) Production Planning and Control, Capacity Management, Business Process Reengineering
Michelle R. Hunt (144) Marketing, Strategy, New Product Development
Anne Y. Ilmich (152) Strategic Management, Research Methods, Finance
William E. Jackson III (56) Financial Institutions, Regulation of Financial Markets, Market Efficiency, Strategic Pricing Issues
Linda S. McDaniel (136) Investigating Judgments in Auditing, Ways to Improve Effectiveness of Audit Procedures
Christine M. Pearson (133) Crisis Management, Organizational Culture/Change, Strategic Planning
Jana Smith Raedy (166) Market Efficiency/Market Anomalies, Financial Analyst Forecasts
Steven Slezak (148) Finance
John P. Workman (138) High-Tech Marketing, Business-to-Business Marketing

Adjunct Professors
Warren E. Baunach (143) Executive Education, Marketing, Competitive Strategy
Gerald Bell (7) Organizational Behavior and Management
Gary W. Dickson (159) Technology Trends and Implications, Determining Information Requirements, Group Support Technologies
James F. Smith (14) Finance, Economic Forecasting
Harold Langenderfer (31) Financial Accounting, Taxation
Martha McGinity Stodd, Management
Valerie Zeithaml (169) Service Quality, Services Marketing

Adjunct Associate Professors
Jeffery Abarbanell (153) Financial Statement Analysis, Valuation, Analyst Forecasting
CL Kendall (26) International Marketing

Adjunct Assistant Professors
Jean Hauser (164) Executive Education, Management
Frank T. Morgan (165) International Business, Latin America, Executive Education
Heidi Schultz (167) Business Communication

Professors Emeriti
Jack N. Behrnan
R. Lee Brunner
Dewitt Clinton Dearborn
Robert DesJardins
G. David Hughes
Thomas H. Jerdee
C. L. Kendall
Clifton Holland Kreps Jr.
Hans E. Krasa
J. Finley Lee
Richard Levin
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 collegial, intimate environment and selective, diverse admissions, 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 strive 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 multipurpose 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 new 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 provides exceptional students the opportunity to develop outstanding functional 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.

Each year, the school honors outstanding M.B.A. candidates with named fellowships. Top candidates who exhibit leadership, exceptional academic performance, and unusually strong potential for successful careers in business receive fellowships covering some or all of tuition, fees, and stipends. In addition, the Kenan-Flagler Business School is a member of the Consortium for Graduate Study in Management, which provides an average of one hundred thirty fellowships for minority men and women for the M.B.A. programs in the eleven member universities. Detailed information regarding these fellowships may be obtained from the dean of the Graduate School or the director of M.B.A. admissions.

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.bschool.unc.edu.

The Executive M.B.A. Program

The Kenan-Flagler Business School's Executive M.B.A. program offers a unique learning opportunity to the highly motivated business manager who wishes to earn an M.B.A. degree without interrupting his or her career. The two-year (including summers) general management program awards the traditional M.B.A. degree. Classes meet on Monday and Thursday evenings and occasional Saturdays.

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.bschool.unc.edu.

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 tight 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 nonaccounting 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.bschool.unc.edu.

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 course 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 course (e.g., survey research, lab experimentation) or another quantitative methodology 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 Management
- 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, normally 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 two semesters 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 $10,000 for the academic year, and a limited number of nonservice awards ranging from $9,000 to $14,000 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. In addition, a $500-$1,250 performance bonus will be awarded at the end of the first four years to all students who meet annual performance goals. 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, McNeil Building, Chapel Hill, NC 27599-3490; (919) 962-3126; kphd_app@unc.edu, wwwbschool.unc.edu.
Courses for Doctoral Candidates

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). Covers fundamental issues in conducting empirical research in the social sciences, focusing on business administration and allied disciplines.

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

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. Masen, 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 THEORY OF FINANCIAL MANAGEMENT I (3).
Prerequisite, permission of the instructor. Introduction to the theories of asset pricing. Fall. Conrad, Gültekin, Rendleman.

381 THEORY OF FINANCIAL MANAGEMENT II (3).
Prerequisites, Business Administration 380 or equivalent and permission of the instructor. Review of tests 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, Illinich, 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.
DEPARTMENT OF CELL BIOLOGY AND ANATOMY

CHARLES R. HACKENBROCK, Chair

Professors
Keith W. T. Burridge (41) Cell Movement, Cytoskeleton, Interactions of Cells with the Extracellular Matrix
Johnny L. Carson (6) Developmental Biology, Pathogenic Mechanisms Involving Mammalian Airways
Noelle A. Granger (42) Developmental Biology, Endocrinology, Neuroendocrinology
Charles R. Hackenbrock (28) Cell Biology, Membrane Biology, Mitochondrial Bioenergetics, Molecular Diffusion
O'Dell W. Henson Jr. (19) Ear Structure and Function, Animal Sonar
Brian Herman (48) Cancer, Atherosclerosis, Apoptosis, Viral Transformation
Kenneth A. Jacobson (39) Membrane Biology and Biophysics, Cell Locomotion, Video Image Analysis
William E. Koch (8) Developmental Biology
Jean M. Lauder (36) Developmental Neurobiology - Roles of Neurotransmitters, Growth Factors and Hormones in Brain Development, Neuronal-Olfactory Interactions
John J. Lemasters (29) Mechanisms of Hypoxic and Toxic Injury to Cells, Confocal Microscopy of Living Cells, Organ Storage for Transplantation
Royce L. Montgomery (11) Invertebrate Disc Lesions and Back Pain
Michael G. O’Rand (38) Cell Biology, Immunology, Reproductive Biology
Roy Peach (12) Histological and Electron Microscope Studies of Nerve and Developing Tissues
H. Benjamin Feng (49) Cellular and Developmental Neurobiology, Development of the Neuromuscular Junction
Peter Petrus (13) Neurobiology, Neuroendocrinology, Reproductive Biology
Aldo Rustioni (15) Neuroanatomy, Neurophysiology, Neurocytology
Thomas W. Sadler (46) Teratology, Developmental Biology, Organ and Whole Embryo Culture
Kathleen K. Sulik (40) Teratology, Embryology

Associate Professors
M. Joseph Costello (50) Membrane Biophysics, Intercellular Junctions, Active Transport, Membrane Fusion, Electron Microscopy
Deborah A. O’Brien (51) Mammalian Spermatogenesis, Expression of Tissue-Specific Gene Products During Germ Cell Differentiation, Cell-Cell Interactions, Mannose 6-Phosphate Receptors
Roy Peach (12) Histological and Electron Microscope Studies of Nerve and Developing Tissues
LLewis H. Romer (3) Signaling During Endothelial Cell Adhesion
Ellen R. Weiss (9) Regulatory Domains of G-Protein Coupled Receptors, Molecular Biology of Cellular Signaling Pathways

Assistant Professor
Michael D. Schaller (2) The Integrins, Protein Tyrosine Kinases and Signal Transduction

Research Associate Professors
Brad Chatotte (1) Mitochondrial Bioenergetics at Molecular and Cellular Levels, Membrane Biophysics and Membrane Biology
Richard Weinberg (20) Quantitative Immunocytochemistry, Glutamate Receptors, Nitric Oxide Synthase

Research Assistant Professors
Jorge Daniel Cortese (4) Mitochondrial Membrane Biology and Biophysics, Membrane Fusion, Lipid-Protein Interactions, Liposome Delivery Systems
Pamela A. Diliberto (10) Growth Factors, Signal Transduction, Intracellular Calcium, Confocal and Video Microscopy
Gerald W. Gordon (14) Instrument Development for Cell Biology Research
Juliet Lee (5) Fish Epidermal Keratocyte, Regulation of Locomotion, Cytoskeleton, Contractility and Adhesion
Shoji Osawa (16) Regulation of Signal Transduction Pathways by G Proteins
Richard Richardson (17) Molecular Biology of Sperm-Oocyte Interaction, Studies of Immunocontraception

Professors Emeriti
Malcolm C. Johnston
William S. Pollitzer

Program of Study

The Department of Cell Biology and Anatomy 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, bioacoustics, 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 usually serve as graduate teaching assistants for two semesters and 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, Bynum Hall. A letter outlining career goals and why they would be helped by study in the department is also required. Complete applications for fall registration should be received no later than December 1 if financial aid is requested for the first year. Prospective students are advised to contact the director of graduate studies in Cell Biology and Anatomy 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 in Isaac M. Taylor Hall. The department's facilities include the laboratories for Cell Biology, the laboratories for Developmental Biology, the Digitized Video Microscopy laboratories, and the Electron Microscopy laboratories.

The department and its laboratories are equipped for studies of biological structure and function from molecular to whole organism levels. Departmental facilities are available for optical imaging of all kinds, including bright field, phase, and fluorescence microscopy; confocal and digitized video microscopy; scanning, transmission, freeze-fracture, and intermediate-high voltage electron microscopy; optical diffraction; fluorescence recovery after photobleaching; autoradiography; immunocytochemistry; electrophysiology; and other techniques of modern tissue, cell, and molecular biology.

Assistantships and Other Student Aid

Financial first-year students are supported by a stipend of $15,000 annually plus tuition, fees, and medical insurance for two semesters. After completion of the Doctoral written exam, second-year students are supported by research and teaching assistantships plus tuition, fees and medical insurance for two additional semesters. Support in subsequent years is the responsibility of the dissertation advisor. The Graduate School offers various fellowships, assistantships, and loans for which application can be made during the regular admission procedures. Assistance in the form of graduate, research, and teaching assistantships is available on a competitive basis to a limited number of students.

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. Fall. 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.


106 THE CELL (3). Prerequisite, a biochemistry course. Comprehensive introduction to cell structure and function. Emphasis on membrane organization, organelles, cell-cell and cell-matrix interactions, the cytoskeleton, motile phenomena, and the regulation of cell growth including cancer cell biology. Fall. Jacobson, Burridge, staff.

107a/b 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. Henison, 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. Sadler.

111fs MICROSCOPIC ANATOMY (4). Lectures and laboratory classes provide an understanding of the microscopic anatomy and histology of the basic tissues and major organ systems of the human body. Primarily for dental students. Fall. Peuch.

117 CELL STRUCTURE, FUNCTION AND GROWTH CONTROL I (Microbiology and Immunology 117, Biochemistry 117, Pharmacology 117) (var). Prerequisite, undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function and transformation. Fall. Jacobson, Lee, Meissner, Paris.

118 CELL STRUCTURE, FUNCTION AND GROWTH CONTROL II (Microbiology and Immunology 118, Biochemistry 118, Pharmacology 118) (var). Prerequisite, (no s) undergraduate cell biology or biochemistry or permission of the instructor. Comprehensive introduction to cell structure, function and transformation. Spring. Jacobson, Lee, Meissner, Paris.

121 EMBRYOLOGY AND DEVELOPMENTAL BIOLOGY (3). Prerequisite, permission of the instructor. A comprehensive study of the mechanisms underlying vertebrate embryogenesis, including cell migration and other morphogenetic movements, cell signaling, cell differentiation, and growth regulation. Fall. Lauder, Sadler.

121A DEVELOPMENTAL BIOLOGY (2). Prerequisite, permission of the instructor. This is the second half of the Embryology and Developmental Biology course (CBIO 121). Fall. Lauder.

123 DEVELOPMENTAL TOXICOLOGY AND TERATOLOGY (Toxicology 123) (2). Emphasis is placed on topics of recent research interest relative to the genesis of environmentally caused and genetically based birth defects. One two-hour session per week (evening). Spring. (1998 and 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. Fundamental principles and concepts of human gross anatomy for physical therapists taught by lectures and cadaver dissection. Emphasis on functional anatomy. Three lecture and six laboratory hours a week. Fall. Montgomery.

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. Montgomery.
Courses for Graduates

200ab  ADVANCED GROSS ANATOMY (4/5). 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. Henson.

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. (1999 and alternate years.) Staff.

310  RESEARCH (2 or more). Credit to be arranged in individual cases. Fall, spring, and summer. Staff.

315  RESEARCH LABORATORY APPRENTICESHIP (3). 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. Eight to twelve hours of laboratory per week. Fall, spring, summer. Staff.

393  MASTER'S THESIS (3).

394  DOCTORAL DISSERTATION (3).

400  GENERAL REGISTRATION (0).

DEPARTMENT OF CHEMISTRY
EDWARD T. SAMULSKI, Chair

Professors
Tomas Baer (1) Physical Chemistry
Max L. Berkowitz (30) Physical Chemistry
Maurice S. Brookhart (2) Organic and Organometallic Chemistry
Richard P. Buck (3) Analytical Chemistry
James L. Cake (5) Organic Chemistry
Michael T. Grimmis (39) Organic Chemistry
Joseph M. DeSimone (49) Synthetic Polymer Chemistry
Bruce W. Erickson (37) Organic and Biological Chemistry
Slayton A. Evans Jr. (9) Organic Chemistry
Eugene A. Irene (38) Electronic Materials, Solid State Chemistry
Donald C. Jicha (17) Inorganic Chemistry
Charles S. Johnson Jr. (18) Physical Chemistry
James W. Jorgenson (36) Analytical Chemistry
Paul J. Kropp (20) Organic Chemistry
Richard W. Linton (27) Analytical Chemistry
Susan T. Lord (50) Biological Chemistry
Thomas J. Meyer (23) Inorganic 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
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
R. Mark Wightman (47) Analytical and Neurochemistry

Associate Professors
John J. Boland (10) Chemistry of Electronic Materials
Malcolm D. E. Forbes (48) Organic and Physical Chemistry
Gary L. Glish (40) Analytical Chemistry
Gary J. Pielak (46) Biological Chemistry
Michael Rubinstein (43) Polymer Physical Chemistry
Cynthia K. Schauer (45) Inorganic Chemistry
H. Holden Thorp (51) Inorganic Chemistry

Assistant Professors
Dorothy A. Eri (11) Physical and Biological Chemistry
Michel R. Gagné (22) Inorganic, Organic, and Polymer Chemistry
James P. Morkin (42) Organic Chemistry
John M. Papanikolas (52) Physical Chemistry
Scott Wallen (54) Analytical Chemistry
Kevin M. Weeks (53) Biological Chemistry

Professors Emeriti
Maurice M. Bursey
Francis N. Collier
Henry H. Dearman
Ernest L. Elie
Richard G. Higley
Richard C. Jarragin
William F. Little

The Department of Chemistry offers graduate programs leading to the degrees of Master of Arts, Master of Science (nontenure), and Doctor of Philosophy in the fields of analytical, biological, inorganic, organic, and physical chemistry, as well as in the more applied areas of microelectronics, polymer chemistry, and biotechnology. Close interaction between the departments of Chemistry, Physics, and Biochemistry reinforces the broad nature of the graduate research program.

Doctor of Philosophy
The Ph.D. degree in Chemistry is a research degree and students normally begin research during the first year in graduate school. As soon as the entering student has selected a research adviser, an advisory committee is established to develop an appropriate course of study designed to meet individual needs. The Ph.D. degree consists of completion of a suitable program of study, a preliminary doctoral oral exam, a written comprehensive examination that is satisfied by cumulative examinations, an original research project culminating in a dissertation, and a final oral examination.

Master of Arts
The Master of Arts degree requires a minimum of thirty semester hours of credit. Courses are determined by the student's advisory committee. A written comprehensive examination that may be satisfied by cumulative examinations, a thesis, and a final oral examination are also required. Admission to the Ph.D. program after completion of the M.A. degree in the department requires approval by the Chemistry Graduate Studies Committee.
**Master of Science (nonthesis)**

The Master of Science (nonthesis) degree requires a minimum of thirty semester hours. The candidate must earn at least twenty-four hours of graduate credit in chemistry and allied subjects, which may include graduate seminars numbered 200 or higher but does not include Chem 331, 341, 351, 361, and 381 (referred to collectively as 3X1). As a substitute for the thesis the candidate must earn a minimum of six hours of Chem 3X1 (a research methodology and seminar course). The student's program of study is determined by the student's advisory committee. A written report submitted to the student's research director describing work done while registered for Chem 3X1 and a written examination that may be satisfied by cumulative examinations are also required. Admission to the Ph.D. program after completing the M.S. degree in the department requires approval by the Chemistry Graduate Studies Committee.

**Research Interests**

**Analytical.** Separation methods: theory and application of chromatography; liquid chromatography in capillary columns; capillary electrophoresis; chromatographic detectors; ultramicro analysis; spectroscopic methods: ion and electron microprobe techniques; Fourier transform infrared and photoacoustic studies; chemical analysis of surfaces (X-ray photoelectron spectroscopy, Auger electron spectrometry, UV photoelectron spectroscopy, secondary ion mass spectrometry, scanning electron microscopy, X-ray microanalysis); mass spectrometry of biological, environmental, organic, and inorganic compounds; ion structures by ion-molecule collision phenomena; collisionally activated decomposition, and ion molecule reactions; laser Raman spectroscopy; surface- and resonance-enhanced Raman spectroscopy; electrochemical methods: electroanalytical and spectroelectrochemical techniques; surface adsorption; chemically modified electrodes; microstructured polymer films; ion-selective membrane electrodes, biosensors; electrochemical synthesis; electrocatalysis; nonaqueous chemistry; coordination chemistry; kinetics and mechanisms of electrode processes; ionic transport in solids; membrane electrochemistry including digital simulation of transient and equilibrium properties; methods of data interpretation: analog and digital computer optimization of experiments; microcomputer applications in chemistry; digital image processing.

**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; 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. Materials chemistry: molecular precursors to materials; solid state lattice design; metal-ion containing thin films; metal-polymer complexes. 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, carbenes 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.


Chemical Microelectronics. Fundamental materials science of materials and structures relevant to modern microelectronics; novel techniques (plasma, ion beam, laser beam, etc.) for the preparation of electronics materials in thin film form; characterization of thin film properties in particular kinetics of formation, electronics, mechanical and optical properties, and kinetics of etching; new and highly conductive organic and inorganic materials including their synthesis and structural characterization; spatially resolved chemical analysis of surfaces, thin films, and microstructures; phenomena initiated by optical, ion, plasma energy that are driven by it, store it, or respond to it.

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.

Materials Chemistry. Many of the most important and exciting scientific and technological problems in the modern world are centered on the preparation, properties, and uses of solid-state materials. This revolution in materials research is reflected in a number of research programs in our department. The new polymer chemistry and microelectronics programs are just parts of this multidisciplinary effort. This many-pronged approach to research includes the chemistry of high temperature superconducting and other ceramic materials, thin film conducting polymers, the synthesis and characterization of well-defined block and graft copolymers, the synthesis and molecular characterization of new engineering thermoplastics and liquid crystalline materials, the synthesis and processing of polymers in environmentally responsible carbon dioxide; the characterization of polymer dynamics by NMR techniques, and molecular conductivity, as well as the chemical design of polymers for catalysis, photoredox activity, and polymer microstructures.

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 130,000 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 Motley Morehead Laboratories completed in 1986. Included are some major facilities managed by Ph.D.-level staff scientists. The Laser laboratory houses various CW Ion, pulsed and dye laser systems, as well as scanning and multichannel laser Raman spectrometers. The NMR laboratory includes 200, 250, 300 (triple resonance) and 400 MHz high resolution FT-NMR spectrometers, plus a 360 MHz wide bore FT-NMR spectrometer suitable for solid polymeric samples with magic angle spinning. A 500 MHz Bruker NMR is located a short walk away in the medical school. The department's surface facility includes two ESCA instruments, a scanning electron microscope and SIMS, and Auger equipment. The protein sequencing laboratory is a joint facility in conjunction with NIEHS in the Research Triangle Park. In addition, the department maintains various UV-visible spectrometers, diode array, 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 an IBM 3090-180 with vector facility (MVS/VM), a large VAX, and a Convex C240 minisupercomputer. Local Ethernet and a campus-wide broadband network link all parts of the campus. There are also links to the North Carolina Supercomputer Center, which houses a CRAY YMP 8-432 supercomputer, a Convex C3840 supercomputer, a 64-processor KSR parallel supercomputer, and an IBM 3090-200. 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 back up 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 the preparation for and supervision of laboratory classes in the graduate 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 (American and foreign) 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. However, 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@net.chem.unc.edu.

Courses for Graduates and Advanced Undergraduates

101 SPECIAL PROBLEMS IN CHEMISTRY (1-3). Prerequisite, to be determined by consultation with the chair of Undergraduate Studies. Equivalent of one to three hours a week. Fall and spring. Chemistry faculty.

120 POLYMER CHEMISTRY (3). Prerequisite, Chemistry 62; prerequisite or corequisite, Chemistry 180 or 182. Introduction to polymer chemistry; synthesis and reactions of polymers; thermodynamics and kinetics of polymerization; physical characterization of polymers; industrial uses of polymers. Spring. Organic and Physical Chemistry faculty.


122 PHYSICAL CHEMISTRY OF POLYMERS (3). Prerequisite, Chemistry 181; prerequisite or corequisite, Chemistry 182. Kinetics of polymerization, molecular weight, distribution and molecular weight measurements, solution properties, solid-state properties of macromolecules. Spring. 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.

124L POLYMER CHEMISTRY LABORATORY (2). Prerequisite, Chemistry 62 or 66H, 62L or 66L, 121. Thermal analysis; solution viscosity; gel permeation chromatography; end group analysis; synthesis; characterization of an unknown polymer. One four-hour laboratory and a one-hour lecture each week. Spring. Chemistry faculty and staff.

130 INTRODUCTION TO BIOLOGICAL CHEMISTRY (Biology 130) (3). Prerequisite, 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 emphasized. Fall and spring. Biological Chemistry faculty.

131 NUCLEIC ACID CHEMISTRY (Biochemistry 131) (3). Prerequisite, 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 coenzymecatalyzed reactions. Spring. Biological Chemistry faculty.


136L LABORATORY TECHNIQUES FOR BIOCHEMISTRY (3). Prerequisite, Chemistry 130. An introduction to important chemical techniques and research procedures of use 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 (Biochemistry 137) (3). Prerequisite, 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.


140 ANALYTICAL METHODS (2). Prerequisite, 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). Prerequisite, Chemistry 41 or 45H, 62 or 66H, and either 180 or 181. Spectroscopy, electroanalytical chemistry, chromatography, thermal methods of analysis and signal processing. Spring. Analytical Chemistry faculty.

141L INTERMEDIATE ANALYTICAL CHEMISTRY LABORATORY (2). Prerequisite, Chemistry 41 or 45H; prerequisite or corequisite, 181; corequisite, Chemistry 141. Experiments in spectroscopy, electroanalytical chemistry, chromatography, thermal methods of analysis and signal processing. One four-hour laboratory a week and a 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, computers, interfacing, and chemometric techniques. Two one-hour lectures a week. Fall. Analytical Chemistry faculty.

142L LABORATORY IN ANALYTICAL RESEARCH TECHNIQUES (3). 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 reactions, electroanalytical voltammetry as applied to analysis and the chemistry of heterogeneous electron transfers, analog electronics, and electrochemical instrumentation. Fall or spring. Analytical Chemistry faculty.

146 ANALYTICAL SPECTROSCOPY I (3). Prerequisite, Chemistry 180 or 182. Fundamentals of interactions of electromagnetic radiation with matter, vibrational, electronic, nuclear magnetic, mass spectrometries, scattering-based spectroscopy, instrumentation and signal processing. Fall or spring. Analytical Chemistry faculty.

147 ANALYTICAL SPECTROSCOPY II (2). Prerequisite, Chemistry 180 or 181. Fundamentals of theory of gaseous ion chemistry, instrumentation, combination with separation techniques, spectral interpretation for organic compounds, applications to biological 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 magnetic resonance spectroscopy, Mössbauer 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: IH and 13C NMR, infrared, ultraviolet, ORD-CD, mass and photo-electron spectroscopy. Chemistry 146 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 organic 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 relationships; 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; Math 83; Physics 27, 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 and 181L. Introduction to quantum mechanics, atomic and molecular structure, spectroscopy, statistical mechanics. Spring. Physical Chemistry faculty.

182L PHYSICAL CHEMISTRY LABORATORY II (2). Prerequisite, Chemistry 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, thin film deposition and etching and microlithography, characterization techniques, electric and dielectric properties of materials. Spring. Chemistry and Physics faculty.

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, Jamagin.

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.

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). Prerequisites, 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.

289 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.

299 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.
DEPARTMENT OF CITY
AND REGIONAL PLANNING

DAVID H. MOREAU, Chair

Professors
Richard N. L. Andrews (37) Environmental Policy
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
Michael I. Luger (38) Urban and Regional Economics and Development, Public Policy Analysis, Infrastructure and Housing
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 (22) Social Behavioral Aspects of Urban Development, Neighborhood Planning and Development
Dale Whittington (29) Environmental Planning, Public Investment Theory, International Planning

Associate Professor
Philip R. Berke (52) Environmental Planning, Land Use Policy, Natural Hazards Mitigation

Assistant Professors
Glenn D. Cassidy (45) Public Finance, Economic Analysis
Edward Fezer (55) Economic Development
Asad Khattak (54) Transportation; Quantitative Analysis
Helmi T. Nponen (48) Planning in Less Developed Countries, Women and Planning, Economic Development
Roberto Quercia (57) Housing Finance, Housing Policy

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. Howes (44) Planning and Government
Gerard McMahon III (56) GIS

Associated Faculty
Richard E. Bilborow, Developing Countries
Milton S. Heath Jr., Natural Resource Law
David J. Hartell, Real Estate Development
Dennis A. Rondinelli, Developing Countries
Judith W. Wegner, Land Use and Local Government Law

Professors Emeriti
F. Stuart Chapin Jr.
Maynard M. Hufschmidt

John A. Parker
James M. Webb
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 twenty-five thousand people, is even closer to 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, has been identified as one of thirty metropolitan areas in the country that will account for half the new jobs in the nation by 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 is 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 men and their physical environment, and adjustments among men in their efforts to meet human needs. Through the planning process we develop means of meeting these needs that 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. Recently, the implementation and management...
aspects of planning—carrying out public policy through programs, projects, budgeting and finance, regulatory controls, and other actions—have also been 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, state and federal government officials, public interest group staff members, and development organization planners. 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 seventeen thousand books, fifteen hundred bound volumes, and eighty-seven 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. (URL: www.lib.unc.edu/planning/).

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 public interest 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. In addition, planning agencies have been established and are operating within the framework of metropolitan, regional, and national governmental programs.

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 agencies 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 steadily 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 sixteen 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 around the end of March, and all decisions are generally complete by May 15.

Forms and instructions for application are mailed by the department upon request. Each applicant is required to pay a nonrefundable $55 fee when submitting an application.

Since the department has limited accommodations, applicants are advised to apply for admission as early as possible. Applicants 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 the most clearly relevant undergraduate backgrounds for planning, there is increasing need in the field for people prepared in the humanities, natural sciences, and business administration, as well as many opportunities for students from other fields.

Applicants are required to take the Graduate Record Examination (GRE). This examination, which should be taken as early as possible (preferably by October prior to the beginning of the academic year in which the student wishes to enter the department), 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 a reasonable balance of students across its primary areas of specialization to make good use of faculty resources, and seeks to have students from a variety of academic and geographical backgrounds. 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 experience.

The department has a strong commitment to providing increased opportunities for minority and disadvantaged persons to enter the planning profession and actively encourages admission of women and 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.

Satisfactory completion of the degree requires completion of a minimum of forty-eight 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-six of
the required forty-eight 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 appropriate 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 presently consist of courses covering planning theory, urban spatial theory, applied microeconomics, analytical methods, 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 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 professional 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, planning 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 students 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 economic development specialization deals with alternative methods of planned intervention at scales ranging from the neighborhood to multistate regions. Local economic development problems and issues, such as central city decline or unemployment, are approached through practice-based analytic; program design, and financing methods. Workshops with public, private, nonprofit, or community-based clients afford opportunities to test economic development strategies. Topics covered include design of development and redevelopment plans, strategies, and projects; economic 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 ventures; community and employee ownership; and the spatial dimension of social and economic change.

Land Use, Transportation, and Environmental Planning focus area prepares students for careers in planning and management of the physical environment and its development. Specialization areas include growth management, environmental planning, coastal management, and transportation planning. The primary focus is the United States state and local context, although much of the material is relevant to national and international contexts. Required knowledge includes understanding of urban spatial relationships, natural systems functions, physical resource utilization, urban development processes, human activities patterns, transport-land use linkages, and legal/institutional arrangements for government planning, regulation, and capital investment. Theoretical principles of urban form and spatial structure are combined with economic concepts to build a rationale for pursuing the public interest through planning and intervention into private markets. Necessary skills include acquisition and analysis of physical systems information; estimation of impacts from proposed 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 and environmental factors at the project, neighborhood, city, county, and regional scales.

Housing, Real Estate, and Community Development focus area concentrates 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 students 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 the local housing, land markets, and investment decisions; and on social theories of the structure and function of local communities. The decisions of the various actors in the development process are analyzed and the changing roles of the public 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 industrialized 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 analytical 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 forty-eight 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**

<table>
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<th>Requirement</th>
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<th>May Be Outside of DCRP</th>
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<td>Urban Spatial Theory</td>
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<td>Economics</td>
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<td>Planning Applications</td>
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<tr>
<td>Total</td>
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</table>

*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 Emil Maltzia.

**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 adviser. 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 formal 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 doctoral 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. The second year is normally spent full time in the program not selected in the first year. After the first two years the student has an additional forty-three semester credits to complete in the Law School and twelve semester credits to complete in Planning.

A catalog and application for admission to the Law School may be obtained from:
Admissions Office
School of Law, CB# 3380
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3380

Further information may be obtained from the program advisers:
Professor David R. Godschalk, Department of City and Regional Planning
Professor Judith Wegner, Dean, School of Law

Combined Program in Business and Planning

Urban development is increasingly a joint public-private enterprise in which planning and management are interrelated. In achieving its goals, private enterprise must understand the public considerations underlying regulations. Similarly, to achieve public development and other goals, public enterprise must understand the market economy and the ways that government regulations affect production, prices, and distribution processes. Increasingly, applicants to both the Planning and Business programs want to pursue career paths in urban development and related fields that combine planning and management and have the flexibility to move between the public and private sectors.

The Department of City and Regional Planning and the Kenan-Flagler Business School have created a program in which students may pursue the master of Regional Planning and master of Business Administration degrees together. Taken jointly, these degrees may be obtained in three years rather than the four ordinarily required. The goals of the combined program are:
• to develop excellence in the study and analysis of development and to train graduates who will improve the state of development practice;
• to train development professionals in real estate development, economics, and finance in assessing the relative costs and benefits of various types of development and in improving the regulatory process and development practices;
• to broaden the real estate training experiences of students to include the public/private financing of affordable housing, codevelopment, and other projects that meet public development goals;
• to introduce business and planning students to the public values associated with regulation of physical development and the market realities of successful development; and
• to establish strong links between the joint degree program in Planning and in Business and members of the development community and the region.

The joint degree program requires a total of eighty-five credit hours, of which twenty-seven hours are credited jointly toward the M.R.P. degree, which requires forty-eight credit hours, and the M.B.A. degree, which requires sixty-four credit hours.
To enter this program, students must apply separately to both the Department of City and Regional Planning and the Kenan-Flagler Business School and must be accepted independently by both. Students entering the program spend their entire first year in either the Planning Department or the Business School and must make this choice at the time of admission. The second year is spent full-time in the program not selected in the first year. After the first two years, students take courses in both business and planning. Sufficient electives can be taken in planning and business so that a curriculum can be tailored to students’ career objectives.

A catalog and application for admission to Kenan-Flagler Business School may be obtained from:
Director of M.B.A. Admissions
The Kenan-Flagler Business School
CB# 3490, McColl Building
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3490

Admission to the Graduate School of Business Administration 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-five semester credit hours. Students are advised to gain approval from faculty advisers for their specific program of courses during the first semester of residence to assure that they can meet all requirements of both programs within the three years.

Information about the Master of Public Administration program may be obtained from:
Director, Master of Public Administration Program
319 Hamilton Hall, CB# 3265
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3265

Further information about the program may be obtained from Professor Michael Luger, Department of City and Regional Planning.

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 1964 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 handbooks, 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 (3). An introduction to the functioning of the urban area as a complex system and to the analysis of policies aimed at development and change. Fall or spring. Faculty.

124 URBANIZATION AND PLANNING IN THE THIRD WORLD (3). Surveys, theories, issues, and planning strategies employed in developing countries. Topics include rapid population growth and urbanization, slum settlements, regional inequalities, problems of the urban and rural poor, and national urbanization policies. Fall. Lacey.


126 URBAN TRANSPORTATION PLANNING (3). Fundamental characteristics of the urban transportation system as a component of urban structure. Methodologies for the analysis and planning of urban transportation. Techniques for the analysis of problems and the evaluation of plans. Spring. Khattrak.

127 PUBLIC TRANSPORTATION (3). A seminar investigating alternative public urban transportation systems including mass transit, innovative transit services, and paratransit schemes. The systems are 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 comparisons, environmental quality, transportation demand management, paratransit planning, the transportation needs of special populations, and international comparisons. Fall. Khattak.

129 TRANSPORTATION PLANNING MODELS (3). Techniques for predicting transportation demand. The transportation planning process: data collection, trip generation, modal choice, trip distribution, and assignment. System evaluation techniques: social, economic, and environmental impacts of transportation; investigation of innovative modeling techniques. Spring. Faculty.

130 QUANTITATIVE ANALYSIS FOR PLANNERS (3). Foundation course in statistical concepts and methods. Descriptive statistics, estimation and hypothesis testing, simple correlation and regression, and information acquisition, analysis, and presentation. Microcomputer laboratory. Fall. Moreau, Khattak, and staff.

131 QUANTITATIVE METHODS IN PLANNING (3). Fundamental quantitative methods as aids in prediction and decision making in planning, including multivariate statistics and decision analysis. Introduction to computer programming and simulation. Spring. Faculty.

135 INTRODUCTION TO REMOTE SENSING AND DIGITAL IMAGE PROCESSING (GEOG 177) (3). Prerequisite, Geography 173 or equivalent. Emphasizes methods of data analysis that offer an automated approach to spatial and nonspatial data synthesis which combines a system of data capture, storage, management, retrieval, analysis, and display. Fall. Walsh.

136-GEOPHYSICAL INFORMATION SYSTEMS (GEOG 191) (3). Prerequisite, Geography 173 or instructor permission. Thematic data sets are used to model and test interactions between spatially oriented information for resource evaluation. Modeling techniques, cartographic output, data overlay methods, and "hands on" computer application are featured. Fall, spring. Moody, Walsh.

142 GENDER ISSUES IN PLANNING AND DEVELOPMENT (WMST 142) (3). This course examines gender differences in the economic development process in the third world and explores methods of incorporating a gender analysis in the work of development planners and policymakers. Fall. Noponen.


Courses for Graduates

200, 201 SPECIAL TOPICS IN PLANNING AND URBANISM (3). Reading and discussions to provide opportunities to develop new concepts and topics in various aspects of city and regional planning. Fall or spring. Faculty.

204 THEORY OF PLANNING I (3). Concepts and logic of planning as a professional activity. Critical overview of current theories leading students to development of a personal philosophy applicable to their work as planners. Fall and spring. Noponen, Berke.


206 INTRODUCTION TO LAW FOR PLANNERS (3). Covers those areas of the law relevant to the practice of planning: e.g., governmental institutions, real property, constitutional law, land use law, and environmental law. Fall. Brower.

207 PROFESSIONAL COMMUNICATIONS (Var.). Workshop on effective professional communications skills. Writing module focuses on writer and written work to build strong presentation. Oral/graphics module focuses on descriptive and persuasive powers and on using graphics for problem solving and presentations. Spring. Godschalk.

210A MICROECONOMICS FOR PLANNING AND PUBLIC POLICY ANALYSIS (Var.). This module will cover consumer preferences and demand; firms, production, and supply; market demand and derived demand; and monopoly pricing and imperfect competition. Fall. Cassidy.

210B INTRODUCTION TO COST-BENEFIT ANALYSIS AND FINANCIAL APPRAISAL (Var.). This module will cover financial appraisal; applied welfare economics; and cost-benefit analysis. Fall. Whitington.

210C INTRODUCTION TO LAND, ENVIRONMENTAL, AND RESOURCE ECONOMICS (Var.). This module covers externalities and public goods theory; economics of zoning; land markets/price; common property resource management; economic tools for environmental protection; non-market valuation methods. Fall. Whitington.

210D MACROECONOMIC ANALYSIS (Var.). This module covers basic concepts in macroeconomics, including production, income, and spending; introduction to macro models, capital spending models; macro theories of economic growth. Fall. Luger.

214 URBAN SPATIAL STRUCTURE (3). Spatial analysis techniques; locational behavior of various urban activity systems; neighborhood choice; political organization of metropolitan regions; normative/Future perspectives on urban form. Fall. Luger.

219 WATER POLICY IN LESSER DEVELOPED COUNTRIES (ENVR 219) (3). Multiobjective 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. Whitington.
222, 223 PLANNING WORKSHOP (3). Problem-solving, client-based course designed to give students experience in applying planning theory and methods to actual problem situations. Second-year students select the section that most closely relates to their specialization. Fall or spring. Faculty.


232 PUBLIC INVESTMENT THEORY AND TECHNIQUES (ENVR 282, PUPA 322) (3). Theory and techniques of public investment planning and benefit cost analysis involving synthesis of economic, political, and technological aspects. Special focus on project and program evaluation in the third world. Spring. Whittington, Cassidy.

233 NATURAL RESOURCE LAW AND POLICY (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 184) (3). Introduction to water resources planning and management. Emphasis on federal and state water resources policies and development of analytical skills for identification of environmental problems associated with urban water resources development. Fall. Moreau.

236 ENVIRONMENTAL QUALITY PLANNING (ENV 286) (3). Covers methods for planning and analysis of regional environmental systems with a focus on management of flows of mass in regional settings that affect the quality of the environment. Spring. Moreau.


240 LAND USE AND ENVIRONMENTAL POLICY (3). History, institutional setting, rationale of state and local land use, and environmental policies. Program and policy frameworks, public and private actors, political and market processes, resource utilization concepts, and policy issues in contemporary development and resource management. Fall. Berke.

241 LAND USE AND ENVIRONMENTAL PLANNING (3). Methods of land and environmental planning at urban and regional scales. Analysis of land use and capability, environmental impacts, population and economic change, and infrastructure capacity. Preparation of land use and critical areas plans. Spring. Godschalk and Kaiser.

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 Rimer.

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 management and predictive analysis of the environmental, transportation, and other infrastructure; fiscal and social impacts of land development projects. Impact mitigation measures are also examined. Spring. Berke.

246 GIS FOR PLANNERS (3). Intensive introduction to operations of PC Arc/Info, the leading geographic information systems software, and its applications to solving planning problems. Includes data capture, display, manipulation, and analysis. Spring. Faculty.

251 REAL ESTATE INVESTMENT AND AFFORDABLE HOUSING (3). Fundamentals of real estate analysis and investment, market analysis, including computer applications and modeling; public interest in private investment decisions; tax and public policy and affordable housing. Taught by the case method. Spring. Staff.

252 HOUSING AND PUBLIC POLICY (3). Examination of housing and market dynamics. Government intervention, the mortgage market and construction industry, housing markets and market analysis, racial discrimination, substandard housing, the homeless, affordability. Evaluation of public policies. Fall. Faculty.

253 ISSUES IN HOUSING MARKET DYNAMICS (3). Prerequisite, PLAN 252 or permission of the instructor. Detailed inquiry into a number of theoretical issues relating to market dynamics: the formulation, execution, and evaluation of housing policy. Among the possible subjects investigated are the structure of the housing market; filtering, housing costs, the nature and efficiency of the construction industry, the economics of slums. Spring. Faculty.

254 DEVELOPMENT STRATEGIES (3). Contemporary methods of resolving development disputes through negotiation, bargaining, and mediation. Techniques and skills applicable to solving controversies over planning and implementation of public and private development projects. Fall. Godschalk.

255 THE DEVELOPMENT PROCESS (BUSI 218) (3). Examination of real estate development from public or private developer's perspective. Process includes stages of activity, decision points, risk-control techniques, modeling, and broad-gauged feasibility analysis. Teaching cases used extensively. Spring. Malizia.

257 PLANNING FOR HISTORIC PRESERVATION (3). Provides introduction to historic preservation as a planning tool, with special emphasis on design, regulatory, and financial aspects. The philosophical underpinnings of preservation and implications of historical designations are reviewed. Spring. Howard.


263 DEVELOPMENT PLANNING TECHNIQUES (3). Basic analytical techniques for analyzing the development of local and regional economies. Topics include social accounts, indicator construction, shift-share analysis, regional input-output analysis, and economic forecasting techniques. Spring. Goldstein.

264 REGIONAL DEVELOPMENT SEMINAR (3). Theoretical perspectives on regional economic development and planning in developing areas. Topics include economic base theory, trade theory, location theory and growth poles, product cycle theory, entrepreneurship and innovation theories. Fall. Noponen.

266 COMMUNITY DEVELOPMENT PLANNING (3). Basic goals of community development planning and public, private, and joint approaches to fostering community change or stability are examined. Methods of community analysis, community organization, project design, and implementation. Fall. Rohe.

267 DEVELOPMENT FINANCE (3). Examination of economic and community development from the strategic and project perspectives. Consideration of project financing and development finance. Other topics include strategic and contingency planning, project management, market studies, and feasibility analysis. Spring. Malizia.
COMMUNITY DEVELOPMENT POLICY. This course is designed to look at the interaction between federal policy and the health of local communities. It begins with a review of community theory and research and then focuses on a number of community development policy issues including displacement, triage, racial discrimination, and dependency. Spring. Rohe.

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.

POPULATION AND HOUSING POLICIES IN THE THIRD WORLD (3). Methods of analysis and policy issues concerned with population growth and slum and squatter settlements in third world cities. Topics include demographic techniques, population policies, and alternative housing solutions for the urban poor. Spring. Lacey.

ADVANCED ECONOMIC ANALYSIS FOR PUBLIC POLICY I (PUPA 288) (3). Economic theory applied to policy issues. Policy issues analyzed require microeconomic theory, including theory of utility and demand, organization and operation of government and market, production theory, regulation, and income and price determination. Spring. Staff.

ADVANCED ECONOMIC ANALYSIS FOR PUBLIC POLICY II (PUPA 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.

THE USE OF RESEARCH IN THE POLICY PROCESS (PUPA 300) (3). Systematically examines use and abuse of policy-relevant research in policy process; connects design and execution of public research with participants in policy process; policy cases are emphasized. Fall. Faculty.

DESIGN OF POLICY-ORIENTED RESEARCH (PUPA 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, quas-experimental designs, and the social experiment are covered. Spring. Goldstein.


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.

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.

PH.D. SEMINAR IN ENVIRONMENTAL MANAGEMENT AND POLICY (ENVR 353, PUPA 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.

DOCTORAL DISSERTATION (Var.). Faculty.

GENERAL REGISTRATION (0).
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 assistance 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 knowledge of 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

101X ELEMENTARY CLASSICAL GREEK FOR GRADUATE STUDENTS (0-3). Introduction to grammar and vocabulary. Reading of easy selections from Plato or other authors. Graduate students whose major departments permit them to take these courses for credit should register for 101 and 102.

102X Registration in 101X and 102X carries no graduate credit. Spring and fall. Staff.

106 GREEK DIALECTS (3). Prerequisite, Greek 22. (Alternate years.) Weiss.

107 GREEK COMPOSITION (3). Prerequisite, Greek 21 or 22. Smith, Weiss.

108 READINGS IN EARLY GREEK POETRY (3). Prerequisite, Greek 21 or 22. (Alternate years.) Brown.

109 READINGS IN GREEK LITERATURE OF THE FIFTH CENTURY (3). Prerequisite, Greek 21 or 22. (Alternate years.) Stadter, West.

110 READINGS IN GREEK LITERATURE OF THE FOURTH CENTURY (3). Prerequisite, Greek 21 or 22. (Alternate years.) West, Wooten.

112 INTRODUCTORY MODERN GREEK (3). Offered irregularly. Staff.

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. Stadter.

Courses for Graduates

NOTE: One or two Greek courses numbered in the 200s are offered each semester.

201 GREEK EPIGRAPHY (3). West.
204 GREEK PALEOGRAPHY (3).
211 GREEK LYRIC POETRY (3). Brown, Race.
212 GREEK TRAGEDY (3). Smith, Reckford, Brown, Race.
213 GREEK COMEDY (3). Reckford.
214 GREEK PHILOSOPHICAL LITERATURE (3). Smith.
215 GREEK RHETORIC AND ORATORY (3). Wooten.
216 GREEK HISTORICAL LITERATURE (3). Stadter, West.
217 HELLENISTIC POETRY (3). Brown.
218 LATER GREEK PROSE (3). Stadter.
251 HOMER (3). Smith, Race.
252 SOPHOCLES (3). Reckford.
253 THUCYDIDES (3). Stadter.
256 DEMOSTHENES (3). Wooten.
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.
400 GENERAL REGISTRATION (0).

Latin

Courses for Graduates and Advanced Undergraduates

101 Section C. ELEMENTARY CLASSICAL LATIN FOR GRADUATE STUDENTS (0-3).
102 Section M. ELEMENTARY MEDIEVAL LATIN FOR GRADUATE STUDENTS (0-3).

102X 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.) Weiss, 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.

113 READINGS IN LATIN LITERATURE OF THE EMPIRE (3). Prerequisite, Latin 21 or 22. (Alternate years.) Houston, Wooten.

114 READINGS IN LATIN LITERATURE OF LATER ANTIQUITY (3). Prerequisite, Latin 21 or 22.
130  MEDIEVAL LATIN LITERATURE TO THE END OF THE
  CAROLINGIAN PERIOD (3). Prerequisite, Latin 14 or 102X.

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).

207  LATIN COMPOSITION AND PROSE STYLES (3). Weiss.

210  HISTORY OF LATIN AND ITALIC DIALECTS (3). Weiss.

221  FRAGMENTS OF EARLY LATIN POETRY (3). Mack.

222  ROMAN HISTORICAL LITERATURE (1). Study of Sallust,
  Caesar, Suetonius, or the minor historians of the empire. Houston,
  Linderski.

224  ROMAN DRAMATIC LITERATURE (3). Study of the comedies
  of Plautus and Terence or the tragedies of Seneca. Rockford.

225  ROMAN LYRIC AND ELEGIAC POETRY (3). Study of the
  forms of lyric and elegiac poetry with special attention to Catullus,
  Horace, Tibullus, or Propertius. Rockford, Mack.

226  ROMAN SATIRE (3). Study of the development of satiric
  form with special attention to Horace or Juvenal. Rockford.

230  LATIN LITERATURE FROM THE TENTH TO THE THIRTEENTH
  CENTURIES (3). Reading in selected medieval Latin prose
  and verse authors.

261  CICERO: POLITICAL CAREER (3). Linderski.

262  CICERO: LITERARY CAREER (3).

263  LUCRETIUS (3). Rockford.

264  VIRGIL (3). Mack.

265  LIVY (3). Linderski.

266  OVID (3). Mack.

270  PETRONIUS (3). Wooten.

274  TACITUS (3). Houston.

301  LATIN SEMINARS (3 each). Topic for 1997-98: Roman
  Religion.

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.

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, con-
  temporary 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 firsthand 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 BYZANTIUM (ART 182) (3). Prerequisite, any course in classics,
  art history, or religious studies. Traces the development of mosaic tech-
  nique from Greek antiquity through the Byzantine Middle Ages as
  revealed by archaeological investigations and closely analyzes how
  dynamic medium conveyed meaning. Spring. Connor.

186  ARCHAEOLOGY OF SYRO-PALESTINE (3). Prerequisite,
  Classical Archeology 45 or 46 desirable. Detailed survey of the cultural
  and historical remains of ancient western Syria and Palestine, to be taught
  in alternating semesters: a) Neolithic-Early Bronze Age (8000-2000
  B.C.); b) Middle Bronze-Iron Age (2000-500 B.C.).

187  MESOPOTAMIA AND THE LEVANT IN THE BRONZE
  AGE (3). The archaeology of Mesopotamia in the Bronze Age, from ca.
  3500 to 1200 B.C. (Alternate years.)

188  THE ARCHAEOLOGY OF THE NEAR EAST IN THE
  IRON AGE (3). A survey of the principal sites, monuments, and art
  of the Iron Age Near East from ca. 1200 to 500 B.C. (Alternate years.)
  Sams.

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.) Koeppel.


194  ARCHaic GREEK SCULPTURE (ART 194) (3). (Alternate
  years.) Sturgeon.

195  CLASSICAL GREEK SCULPTURE (ART195) (3). (Alternate
  years.) Sturgeon.

196  HELLENISTIC GREEK SCULPTURE (ART 196) (3).
  (Alternate years.) Sturgeon.

198  AEGEAN CIVILIZATION AND NEAR EASTERN BACK-
  GROUNDS (ART 198) (3). (Alternate years.) Haggis.

Courses for Graduates

201  GREEK EPIGRAPHY (3). See courses in Greek.

202  LATIN EPIGRAPHY (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.

294  GREEK TOPOGRAPHY (ART 294) (3). Study of chief archaeo-
  logical 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.)
  Koeppel.
297 ROMAN PAINTING (ART 297) (3). (Alternate years.) Koeppel.
298 ROMAN TOPOGRAPHY (ART 298) (3). (Alternate years.) Koeppel.
299 ETRUSCAN ART (ART 299) (3). (Alternate years.) Staff.
341 SPECIAL READING IN ARCHAEOLOGY (3). Fall and spring. Staff.
358 SEMINAR IN ANCIENT ART (ART 358). (3). Fall and spring. Sturgeon.
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 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 (HIST 109) (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.) Talbert.
112 CLASSICAL, CHRISTIAN, AND POSTCLASSICAL RHETORICS (CMPL 112) (SPCH 112) (3). Study of the classical tradition in rhetoric and reactions against it from the fourth century B.C. to the eighteenth century of the Christian era. Spring.
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), we will discuss a) the principles of Roman constitutional law and b) the legal logic and social importance of Roman civil law. (Alternate years.) Lindenks.
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.) Conosco.
121 GREEK PHILOSOPHICAL LITERATURE (3). An examination of major Greek philosophers, read in English translation, in the context of Greek intellectual history and civilization. (Alternate years.) Smith.
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. Although M.A. candidates do not take a formal minor, some departments permit them to take several courses outside their major. Interested students should consult their departmental advisers. Any student may, of course, take Medieval Studies courses without seeking a formal minor.

The student who wishes to earn a minor in Medieval Studies must take at least five courses chosen from the following:

a. Two courses in Latin: Latin 203 (Latin paleography) and a course in medieval Latin studies (Latin 114, 130, or 230).

b. Three courses from at least two of the following areas (a student may not count courses taken in the major department toward this minor):

1. Medieval vernacular language and literature (in the original language).


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. Sniff.
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.
153  Medieval Romance. Kennedy.
238  History of the English Language. Eble, O'Neill.
250  Beowulf. Leinbaugh, O'Neill, Wittig.
251  Studies in Middle English Literature. Kennedy, Wittig.
350  Seminar in Old English Language and Literature. Wittig, O'Neill, Leinbaugh.
351  Seminar in Middle English Literature. Kennedy, Wittig.

**Germanic Languages**

160  History of the German Language. Smith, Roberge.
233  Old Norse I. Smith.
234  Old Norse II. Smith.
255  Gothic. Smith, Roberge.
270  Old High German. Roberge.
271  Middle High German. Francke.
275  Old Saxon. Smith, Roberge.

**History**

106  The Medieval Church. Pfaff.
107  Europe in the Early Middle Ages. Behrends.
110  The Medieval University. McVaugh.
133  English Economy and Society, 1200-1700. Bennett.
223  Readings in Medieval Women's History. Bennett.
224  France, the German Empire, and the Papacy in the High Middle Ages. Behrends.
243  Late Medieval England. Bennett.
311  Medieval History. Behrends.

**Music (Monophonic Song)**

251  Ars Antiqua and Ars Nova. Nádas, McKinnon.

**Philosophy**

152  Topics in Medieval Philosophy. Galligan, Long.

**Religion**

169  Medieval Religious Texts. Kaufmann.

**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  Provençal. Montgomery.
Romance 324  Romance Paleography. Montgomery.
Spanish 213  Medieval Poetry. Dominguez, Bandera.
Spanish 221/2  Old Spanish. Binotti.
Spanish 224  Medieval Prose. Bandera, Dominguez.

**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

Michael E. Dyson (17) Cultural Studies, Religious and African American Communication

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

Lawrence B. Rosenfeld (11) Interpersonal Communication, Family Communication, Empirical Research Methodology

Julia T. Wood (12) Interpersonal Communication, Gender and Communication, Feminist Theory

**Associate Professors**

Cora Dauber (2) Rhetoric and Public Address

Howard D. Doll (4) Interpretation of Literature, Group Performance, Career Speech

Paul Ferguson (5) Performance of Literature, Directing, Adaptation and Script Writing

D. Soyini Madison (15) Theory and Ethnography of Performance, African American and Third World Women's Texts

Della Pollock (9) Performance of Literature, Performance Theory and Criticism, Cultural Studies
Assistant Professors
Joanne Hershfield (20) Film Theory and Criticism, Third World Film, Film and Video Production
Ken Hillis, Communication Technology
Victoria Johnson, Media and Cultural Studies
James Lee (8) Information and Third World Communication, Communication Technology and Social Change, Audio Production
Steven K. May (13) Organizational Communication, Cultural Studies
Anna McCarthy (22) Film and Television History, Video Art and Aesthetics, Feminist Theories of Popular Culture, Critical Social Theory
Lisa Skow, Interpersonal Communication
Michael S. Waltman (14) Interpersonal Communication, Social Cognition

Professors Emeriti
Elizabeth Czech-Beckerman
Robert J. Gwyn
Martha Nell Hardy
William M. Hardy
J. Paul Nickell
James W. Pence Jr.
Wesley H. Wallace

The Department of Communication Studies offers graduate work leading to the degree of Master of Arts. A variety of perspectives on communication are offered, including interpersonal and organizational communication, media and cultural studies, performance studies, and rhetorical 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. 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.

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:

- 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.
- Passing COMM 200, an introductory course to theory in communication; COMM 201, Research Colloquium.
- Passing at least one course designed to develop capability in critical, historical, and/or social scientific methods of communication research.
- Passing an oral comprehensive examination, usually in the third semester of study.
- Completing a research or production-centered thesis, including an oral defense, for three or six hours credit, depending upon the breadth of the enterprise.
- Completing all requirements and deadlines of the Graduate School for 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 31, and should include the following:

- The General Record Examination, with a recommended minimum score of 1000 on the verbal and quantitative combined sections;
- Two official transcripts from all post-secondary educational institutions;
- Three letters of recommendation, at least two of which should include specific details about the applicant's educational background; and
- A personal statement explaining why the applicant wishes to pursue graduate work in this department, his/her goals, and any additional information not requested elsewhere.

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 Web site at www.unc.edu/depts/comm.

Financial Aid
Financial assistance is available in several forms. Please see the "fellowships and financial aid" heading 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. The current stipend for a first-year student is a minimum of $2,600 per semester for a half-time teaching assistantship position. Generally, first-year students assist with two large introductory undergraduate courses. All assistantship assignments are awarded on a competitive basis. In some cases, out-of-state applicants who are awarded an assistantship are recommended 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

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 application of research.

111 INTRODUCTION TO CRITICAL PERSPECTIVES (3). This course, assuming all humans are critics, explores theories of criticism and symbolic action through readings, lecture, and practical criticism of literature, film, discourse, and other symbolic acts.

112 PERSUASION (3). Examines contemporary theory and practice of influencing others' attitudes, beliefs, and actions. Focuses particularly on analyzing and developing 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, actors, and media influence on political beliefs.
114 SOCIAL DIALECTS (3). An examination of the nature and role of language, language usage, and dialect in the United States.

120 INTERPERSONAL COMMUNICATION (3). Course focuses on how communication is used to build and sustain interpersonal relationships. Forms and functions 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 following: COMM 22, 72, 73, 74. Examines interpersonal and public communication among people from different cultures. Includes case studies of individuals, subcultures, and nations.

123 COMMUNICATION IN ORGANIZATIONS (3). Examines internal and external systems of communication; information flow; public, small group, and interpersonal communication.

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 physical appearance; body, face, and eye movements; paralinguistics; haptics; nonverbal deception; the effects of environment; and personal space.

129 TOPICS IN INTERPERSONAL AND ORGANIZATIONAL COMMUNICATION (3). Designed for advanced students, course provides in-depth examination of particular theories of human communication. Course focus varies.

130 ADVANCED AUDIO PRODUCTION (3). Prerequisites, COMM 14, 34. 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, direction 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. 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 nonfiction or documentary projects. The course focuses on narrative, representational, and aesthetic strategies of documentary production.

139 SPECIAL TOPICS IN MEDIA PRODUCTION (3). Prerequisites. A special topics course on a selected aspect of media production or writing.

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 aurality, psychoacoustics, and the development of the audio aesthetics. Course includes, but is not limited to, audio in film, video, and multimedia installations.

142 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 (3). Study of the emergence of 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.

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.

147 HISTORY OF FILM II-1945 to Present (3). Prerequisite, COMM 41. Students study development of film post-World War II to present by examining films, filmmakers, and the emergence of national cinemas through interaction among aesthetic, social, economic, and technological factors. Spring. Kindem.

148 CINEMA OF THE THIRD WORLD (3). Designed for the non-major, this course examines contemporary filmmaking in Africa, Latin America, and the Middle East as an 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 new 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 (OMC 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 INTRODUCTION TO INSTRUCTIONAL MATERIALS PRODUCTION (EDCI 113) (3). The planning and production of two- and three-dimensional instructional materials such as: television graphics, slides, overhead transparencies, manipulative tactile materials, and animated pictures.

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.

160 PERFORMANCE OF LITERATURE BY WOMEN OF COLOR (WMST 146) (3). Prerequisite, COMM 60 or permission. The course explores contemporary poetry, feminist discourse, and performance traditions by Latina, Native American, and African American women. Study of culture and performance culminates in the enactment of poetry.

161 ORAL HISTORY AND PERFORMANCE (WMST 173, HIST 173) (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. The course explores advanced performance theory while focusing exclusively on contemporary poetry, prose fiction, and drama intended for young audiences. Both solo and group performances for young viewers are included.

164 POETRY IN PERFORMANCE (3). Prerequisite, COMM 60. Critical, aesthetic, and rhetorical approaches to performed poetry.

165 PERFORMANCE IN EVERYDAY LIFE (3). Prerequisite, COMM 60 or ENGL 26. Approaches to the relationship between poetry and dramatic action in performance of selected poetic dramas.

166 NARRATIVE FICTION IN PERFORMANCE (3). Prerequisite, COMM 60. Study of selected short stories and novels in performance with emphasis on narrative point of view.

167 RHETORIC OF PERFORMANCE (3). Prerequisites, COMM 60 or 62 and one 100-level COMM class. Addresses rhetorical conceptions of performance. Topics may include performance in ritual and cultural theory; modernist avant-gardism and epic theatre; postmodern performance; performance of oral history.

168 NARRATIVE IN FICTION AND FILM (3). Prerequisite, COMM 60. 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. Advanced study of selected topics drawn from performance history, theory, and practice.

170 CLASSICAL RHETORIC (CLAS 112) (3). Lecture on the nature, development, and influence of Greek and Roman rhetoric, with class discussion of important rhetorical treaties.

171 RHETORICAL THEORY AND PRACTICE (3). Prerequisite, COMM 72, 74, or instructor's permission. Investigates contemporary theories of purpose, symbolic behavior; focus is on rational, psychological, and dramatic explanations of human behavior.

172 PUBLIC POLICY ARGUMENT (3). Prerequisite, COMM 71 or permission of the instructor. Analyzes arguments in twentieth-century decisions in an attempt to understand bases of "justification"; topics include deliberation about values, the logic of prediction, and the criterion of "reasonableness" in selection of a policy alternative.

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 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.

180 INTRODUCTORY AUDIOLOGY (SPHS 123) (3).

182 APPLIED PHONOETICS (SPHS 140) (3). A study of 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 (EDSP 143) (3). An introduction to the study of communication disorders.

200 INTRODUCTION TO RESEARCH AND THEORY IN COMMUNICATION STUDIES (3). Prerequisite, admission to graduate program or permission of the chair. This course is designed to introduce students to the historical development and recurrent research emphasis of the discipline of communication studies. Required of all graduate students. Fall.

201 RESEARCH COLLOQUIUM (1). Workshop on conducting research in communication studies. Required of all candidates for the M.A. degree. Fall.

210 RESEARCH IN INTERPERSONAL COMMUNICATION (3). Prerequisite, COMM 110. Special emphasis on survey research, content analysis, and experimental design. The designs 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 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.

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 (3). This course focuses on the relationship between culture and performance through the involvement of ethnographic praxis. Fieldwork research will culminate in a written and oral presentation advancing a rhetorical position.

250 MEDIA AND 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.

255 HISTORY OF CULTURAL STUDIES (3). This class 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). Prerequisites, 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). The course will explore poetry, drama, and fiction by selected writers of African descent across the diaspora, particularly in the Americas, the Caribbean, Europe, and Africa.

269 TOPICS IN PERFORMANCE STUDIES (3). Prerequisite, second-year graduate students and/or consent of the instructor. Special problems in performance studies.

298 TOPICS IN RESEARCH METHODS (3). Advanced study of selected topics in research methods. Topics vary.

322 SEMINAR IN FILM AND COMMUNICATION (3). This course is an advanced seminar in which students may study family communication and produce original research.

329 TOPICS IN INTERPERSONAL AND ORGANIZATIONAL COMMUNICATION (3). Special topics in interpersonal communication and/or special problems in organizational communication. Course foci vary.

342 SEMINAR IN PERFORMANCE AND CULTURAL STUDIES (3). This course focuses on performance-related issues in the emergent field of cultural studies.

345 PERFORMANCE AND THE POLITICAL ECONOMY (3). This course examines social relations, particularly power relations, by focusing on resistance as performance and the performance of resistance arising from the dynamics of socio-economic conflicts within specific cultural locations.

350 SEMINAR IN MEDIA STUDIES (3). Selected problems in media aesthetics. Exact topic to be covered is announced before classes begin.

351 SEMINAR IN MEDIA 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.

353 SEMINAR IN POPULAR CULTURE (3). This course will look at special topics in the study of popular culture. Designed for advanced graduate students, 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 cultural studies.

358 SEMINAR IN FEMINIST STUDIES OF FILM AND TELEVISION (3). Prerequisite, graduate standing. This graduate seminar explores theoretical 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.

379 TOPICS IN RHETORICAL AND CULTURAL STUDIES (3). Prerequisite, COMM 211. Special problems in rhetorical and cultural studies.

390 PRACTICUM COMMUNICATION STUDIES (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.

393 MASTER'S THESIS (3 or 6). Fall and spring. Members of the graduate faculty.

400 GENERAL REGISTRATION (0).

NOTE: Courses are offered on demand except as otherwise noted.
CURRICULUM OF COMPARATIVE LITERATURE

Edward Donald Kennedy, Chair

Professors
Dino Cervigni (44) Medieval and Renaissance Italian Literature, Autobiography
Paul DeBreceny (8) Russian Literature, Short Story
Lilian R. Furst (4) Nineteenth-Century Literature, Problems and Methods
Edward Donald Kennedy (22) Medieval Literature
Clayton Koelb (5) Literary Criticism, Nineteenth- and Twentieth-Century German Literature
G. Mallory Masters (8) Renaissance Literature, French Literature
John P. McGowan (45) Critical Theory
James L. Peacock (11) Anthropology, Symbolic Systems
Richard A. Smyth (14) Aesthetics, Philosophy, and Literature
Philip A. Stadter (16) Classical Historiography, Renaissance Latin

Associate Professors
Alice A. Kuzniar (17) Romanticism, German Literature
Diane R. Leonard (2) Modern Narrative, Modern Criticism and Theory
José Manuel Polo de Bernabé (34) Nineteenth- and Twentieth-Century Spanish Drama and Poetry, Critical Theory

Assistant Professor
Eric S. Downing (6) Eighteenth- and Nineteenth-Century Literature, Literary Theory, Classics

Professors Emeriti
Eugene H. Falk
S. K. Heninger Jr.
George A. Kennedy

The graduate program in Comparative Literature is based on the concept that the literatures of the West form a broad unity that transcends national boundaries. The curriculum stresses the systematic 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, and the United States.

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 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 additional 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 CRITICAL THEORY (3). Comparative study of representative works on literary and cultural theory or applied criticism to be announced in advance. (Alternate years.) Leonard.

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. (Alternate years.) 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. (Alternate years.) Masters.

173 BAROQUE (3). Comparative analysis of the characteristic themes of seventeenth-century prose and poetry with sampling of representative texts from Italy, France, Spain, Germany, and England. (Offered irregularly.)

174 THE EIGHTEENTH CENTURY (3). A study of eighteenth-century European literature, its regional manifestations, the development of its genres, and its relation to the Enlightenment, neoclassicism, rationalism, and cults of sensibility. Readings of major literary and philosophical texts, and recent critical assessments. (Alternate years.) Downing.

175 ROMANTICISM (3). An exploration of the period concept of romanticism using manifesto and critical writings of the time, modern studies on the subject, and selected literary works. (Alternate years.) 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. (Alternate years.) 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. (Alternate years.) 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. (Alternate years.) Leonard.

B. Genre Courses

180 CONCEPTS AND PERSPECTIVES OF THE TRAGIC (3). Classical, Biblical, Renaissance, and modern traditions of the tragic; primary texts drawn from philosophical and literary discourses. Literary readings include Samuel I and II, Greek myths and drama, Shakespeare, German Trauerspiel, Faulkner. Critical readings include Aristotle, Burke, Nietzsche, and others. (Alternate years.) 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.)

185 APPROACHES TO THE NOVEL (3). The narrative techniques of selected works by Proust, Kafka, Mann, Faulkner, Sartre, Woolf, Camus. (Alternate years.) Leonard.

C. Special Topic Courses

145 HISTORY OF AESTHETICS (3). Ancient and modern positions in aesthetics, with attention to their philosophical foundations and their significance to the study of literature. Including Plato, Aristotle, Plotinus, Kant, and Hegel. (Offered every third year.) Smyth.

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, Cellini, and Montaigne. (Alternate years.) 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. 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 process of recognizing and constructing ironies in texts, with consideration of both theoretical issues and practical readings. (Alternate years.) 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.) Masters.

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.

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). Spring. 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.

400 GENERAL REGISTRATION (0).

Cross-Listed Courses

104 (Romance Languages 104; Peace, War, and Defense 190) VIOLENCE AND RELIGION IN LITERATURE FROM EPIC TO NOVEL (3).

112 (Classics 112) CLASSICAL, CHRISTIAN, AND POST-CLASSICAL RHETORICS (3).

135 (Anthropology 135) CONSCIOUSNESS AND SYMBOLS (3). Peacock.

142 (Philosophy 142) PHILOSOPHY IN LITERATURE (3). Smyth.

153 (English 153) MEDIEVAL ROMANCE (3). Kennedy.

179 (English 179) LITERATURE OF THE AMERICAS (3). Whisnant.

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 Fine Arts, 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 Folda
Classics: Philip Stader
English: Christopher Armitage, Reid Barbour, Alan Dessen, Anne Hall, Ritchie Kendall, Darryl Gless, Megan Matchinske
History: Melissa M. Bullard, Barbara Harris, John Headley, Michael McVaugh, Jay Smith
Music: James Haar, John Nádas, Howard Smither, Thomas Warburton
Religious Studies: Peter Kaufman
Romance Languages: Cesareo Bandera, Lucia Binotti, Dino Cervigni, Angel L. Cilveti, Frank Dominguez, G. Mallary Masters, Ennio I. Rao, Frederick Vogler

DEPARTMENT OF COMPUTER SCIENCE

STEPHEN F. WEISS, Chair

Professors
Henry Fuchs (11) High-Performance Graphics Hardware, 3D Medical Imaging, Head-Mounted Display, Virtual Environments
John H. Halton (26) Applications of Combinatorial and Probabilistic Methods and of Scientific and Mathematical Analysis to Computational, Scientific, and Engineering Problems
Gyula A. Magács (2) Parallel Computation, Computer Architecture, Programming Languages
Stephen M. Pizer (6) Image Analysis and Display, Human and Computer Vision, Graphics, Numerical Computing, Medical Imaging
David A. Plaisted (28) Mechanical Theorem Proving, Ter rewriting Systems, Logic Programming, Algorithms
John B. Smith (25) Computer-Supported Cooperative Work, Hypermedia Systems, Human-Computer Interaction, Text and Natural Language Processing
Stephen F. Weiss (10) Information Storage and Retrieval, Natural Language Processing, Communications and Distributed Systems, Computer-Supported Cooperative Work

Associate Professors
Gary Bishop (39) Hardware and Software for Man-Machine Interaction, 3D Interactive Computer Graphics
Prasun Dewan (63) User Interfaces, Distributed Collaboration, Software Engineering Environments, Object-Oriented Databases
Kye S. Hedlund (22) Computer-Aided Design, Computer Architecture, Algorithm Design and Analysis, Parallel Processing
Jan F. Prins (33) Parallel Algorithms, Languages, and Architectures, High-Level Programming Languages, Formal Techniques in Program Development

Assistant Professors
Siddharth Chatterjee (68) High-Level Programming Languages, Compilation for Highly Parallel Machines, Object-Oriented Programming, Parallel Algorithms and Architectures
Ming C. Lin (72) Physically Based and Geometric Modeling, Applied Computational Geometry, Robotics, Distributed Interactive Simulation, Virtual Environments, Algorithm Analysis

Research Professors
Christina A. Burbeck (64) Visual Perception, Visual Object Representation, Visual Background Representation, Virtual Worlds
Nicholas England (67) Systems Architectures 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
F. Donelson Smith (42) Distributed Systems, Computer-Supported Cooperative Work, Operating Systems, Computer Networks

Research Associate Professors
Anselmo A. Lastra (52) Computer Graphics, Parallel Computing

Research Assistant Professors
Doug L. Hoffman (74) Parallel Algorithms, Parallel Architecture, Distributed Systems, Bioinformatics, Computer-Aided Protein Science
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, Telecollaboration
Mary C. Whitton, Virtual and Augmented Reality Systems for Data Visualization, Computer Graphics System Architecture

Lecturers
Jeannie M. Walsh (56) Computer Education, Social, Legal, and Ethical Issues in Computing

Adjunct Professors
Hussein Abdel-Wahab (55) Computer-Supported Cooperative Work, Multimedia Systems and Communications, Distance Learning, Distributed Systems, Operating Systems, Networking

Adjunct Associate Professor
Adjunct Assistant Professors
Stephen R. Aylward (73) Statistical Pattern Recognition, Shape-Based Object Representation, Image Processing, Neural Networks
John G. Eyles (38) Graphics Architectures, Rapid System Prototyping, Virtual Environments, VLSI Design

Professors Emeriti
Peter Calingaert
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 graduate teaching and research and it offers graduate degree programs only. Most of our approximately one hundred and thirty students are full time. Undergraduate instruction is limited to service courses and to participating in the Computer Science options of the curricula in Applied Sciences and Mathematical Sciences. Research particularly emphasizes:
- 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.

Two closely related graduate degrees are offered. The Ph.D. program prepares teachers and researchers for positions with universities, government research laboratories, and industry. The M.S. program prepares highly competent and broadly skilled practitioners. The curricula are oriented toward the design and application of real computer systems and toward that portion of theory that guides and supports practice.

The course of study for the M.S. degree includes algorithms, programming languages, and hardware, as well as important areas of application. The Ph.D. program requirements subsume those of the M.S. program. Students pursue particular areas of their own and are actively involved in research.

The Computer Science Students Association sponsors both professional and social events and represents the students in departmental matters. Its president is a voting member at faculty meetings. There is much interaction between students and faculty, and students contribute to nearly every aspect of the department's operation.

Degree Requirements

Master of Science. An M.S. candidate must earn thirty semester hours of credit, of which six hours may be transferred from another institution or program. A thesis is optional; if one is written, it counts for six hours. Course work in the M.S. program consists of a core of five required courses (the Core: COMP 202, 203, 204, 205, 206), plus electives. Students with stronger preparation can substitute more advanced elective courses for core courses. A comprehensive examination is required. In addition, the student must have performed the following: (1) programmed and documented a program product, and (2) written a significant piece of technical prose. Requirement one can be satisfied by course work or by presenting satisfactory documentation of previous experience. Requirement two can be satisfied in one of three ways: (1) by taking the writing course COMP 291, (2) by writing a thesis, or (3) by writing a technical document in either academic or nonacademic work. Although the M.S. degree has been earned in as little as twelve months, two academic years are normally required by a student with an assistantship.

Doctor of Philosophy. A Ph.D. candidate must take several courses, typically fifteen to eighteen hours, in addition to the courses required in the M.S. program, must pass a comprehensive exam on the Core, and must have satisfied the two experience requirements listed above. Additional requirements include completing a teaching assignment; passing an oral qualifying exam, and an oral exam on the dissertation area; and submitting and defending 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.

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 conference areas to facilitate interaction among students and faculty. The building contains the 60-seat Hugh Holman video teleclassroom, a 125-seat auditorium; the Lib Moore Jones Faculty Conference Room; a reading room; and various study areas, conference rooms, and research laboratories.

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 distributed, parallel, and collaborative 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 more than four hundred computers, ranging in performance from three million instructions per second (MIPS) to more than twelve hundred MIPS. 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 include specialized equipment and facilities (see "Research Laboratories").

General computing systems include approximately 50 Sun workstations, 75 DEC workstations, 65 HP workstations, 18 SGI workstations, 130 Apple Macintosh systems, and 150 Intel-based personal computers. Main memory on each computer ranges from 12 megabytes to 2 gigabytes. Output facilities include laser printers, color printers and plotters, high-speed dot-matrix printers, a slide maker, and transparency-making equipment.

The parallel computing facilities include both the department's own designs, such as the PixelFlow graphics multiprocessor (developed in collaboration with Hewlett-Packard Corporation), and commercial machines, including several parallel SGI Onyx and Power Onyx machines, and several Sun multiprocessor systems.

Our primary software environment consists of the UNIX operating system, Andrew File System (AFS), and the X Window System. Languages most commonly used include C, C++, Java, Prolog, Turing, and Eiffel. Document preparation is usually accomplished via Macintosh and PC systems. Our extensive software holdings are continually evolving.

The department's computer systems are connected to one another by a high-speed network. The campus FDDI ring 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 Sitterson Hall also incorporates a satellite earth station.

The department has a video edit suite, which contains extensive facilities for recording, editing, and producing high-quality videotapes. The department also has access to computing facilities at the University's Department of Academic Technology and Networks (ATN). These facilities include a number of UNIX systems, which provide services such as electronic mail, personal Web space, and statistical and research computing for the University's faculty, staff, and students. The department has access to CRAY supercomputers and high-performance clustered workstations at MCNC's North Carolina Supercomputing Center.

Almost every student is assigned to a one- or two-person office, with a few in larger, three-person offices. Each student is assigned a computer.

Libraries. Students have access to the entire University library system, which includes three major centralized and several satellite libraries containing more than 4 million volumes, 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.

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;
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.

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 expected. In recent years, 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 625.

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 relevant to the applicant's qualifications for graduate study but which is not included 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 a student'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, which reviews all applications, ranks the applicants based on 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.

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.

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 1997-98 is $12,500 (20 hours a week). Full-time summer employment on a research project is normally available to students wishing support. The current rate is $610 per week (40 hours) for 10 to 12 weeks. This produces a combined annual financial package for graduate assistants of approximately $19,000. This assistantship qualifies students for the North Carolina resident tuition rate, currently $1,075 per semester for nine or more credit hours (nine hours is normal for students with an assistantship). 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.

The department provides a $500 educational fund each semester to any student who is admitted with a portable fellowship. The fund may be used for education-related expenses including tuition, books, journals, travel, computer supplies and accessories, and professional memberships. The department also awards a $1,500 stipend each semester to non-service fellowship holders who join a research team.

To apply for an assistantship, 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 a specific research project or teaching assistant position 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. Most incoming students begin by serving as teaching assistants while they explore various research assistant alternatives. Students are encouraged to gain professional experience through summer internships with companies in the Research Triangle area or in other parts of the country. During the academic year, there are also part-time employment opportunities in other departments at UNC-Chapel Hill and at local companies. Students who desire part-time employment usually find satisfactory arrangements with little delay.

Deadlines. The fall semester runs from late August to late 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, the Graduate Record Examination (GRE) should be taken 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. To be considered for these assistantships, completed applications should be received no later than October 15 and the GRE taken no later than June. International applicants should complete their applications earlier to allow time for processing visa documents.

For more information, write to the Director of Graduate Admissions, Department of Computer Science, CB# 3175, Sitterson Hall, Chapel Hill, NC 27599-3175, or send electronic mail to admit@cs.unc.edu. Interested persons are encouraged to visit the department's Web site, www.cs.unc.edu.

Courses


120 COMPUTER ORGANIZATION (3). Prerequisite, COMP 110 or 114. Data representation, computer architecture and implementation, assembly language programming. Spring. Magó, Hedlund.
121 DATA STRUCTURES (3). Prerequisites, MATH 81 and COMP 114. The analysis of data structures and their associated algorithms. Abstract data types, lists, stacks, queues, trees, and graphs. Sorting, searching, hashing. Fall. Hedlund.

121 OBJECT-ORIENTED AND UNIX SYSTEMS (1). Prerequisite, COMP 114. Corequisite, COMP 121. Introduction to C++ programming in the UNIX environment. Classes, object-oriented programming, derived classes, inheritance, and virtual functions.


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, Weiss.

136 INTRODUCTION TO COMPUTER GRAPHICS (3). Prerequisites, COMP 121 and MATH 83. 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.


143 TCP/IP NETWORKING AND NETWORK PROGRAMMING (INLS 186) (3). See course listings for School of Information and Library Science.

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). See course listings for School of Information and Library Science.

171 NATURAL LANGUAGE PROCESSING (INLS 115) (3). Prerequisite, COMP 14 or 15. See course listings for School of Information and Library Science.

172 INFORMATION RETRIEVAL (INLS 172) (3). 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 or spring. Staff.


206 COMPUTER ARCHITECTURE AND IMPLEMENTATION (3). Prerequisites, COMP 120, PHY 102. Architecture and implementation of single-processor computer systems. Processing unit, control unit, memory system, and input/output system. Instruction set design. Pipelining and vector processors. Fall. Maglo, Brooks.

220, 221 MATHEMATICAL 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, searches, sorts. Fall and spring. Staff.

224, 225 MATHEMATICAL 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 and 130. Database management systems, implementation, and theory. Query languages, query optimization, security, advanced physical storage methods and their analysis. (On demand.) Staff.


233 DISCRETE EVENT SIMULATION (ORSA 233) (3). See course listings for Department of Operations Research.

236 COMPUTER GRAPHICS (3). Prerequisites, COMP 120, 121, 235. Study of graphics hardware, software, and applications. Data structures, graphics, languages, surface representations, pen-tracking, response time, and control programs. Spring. Coggins, Brooks, Fuchs.

238 RASTER GRAPHICS (3). Prerequisites, COMP 236 or permission of the instructor. Hardware, software, and algorithms for raster devices such as video displays; frame buffers, multiprocessor systems; hidden-line/visible-surface processing; anti-aliasing techniques, modeling of shadows, curved surfaces, natural textures. Fall. Whitted, Fuchs.

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.

240 ADVANCED COMPILERS (3). Prerequisites, COMP 140, 144, 181. Tools and techniques of compiler construction: Lexical, syntactic, and semantic analysis, code generation and optimization, errors and recovery. (Alternate years.) Prins, Chatterjee.


243 DISTRIBUTED SYSTEMS (3). Prerequisite, COMP 203. Design and implementation of distributed computing systems and services. Interprocess communication paradigms; naming and name resolution; security and authentication; access control, fault tolerance, and replication in distributed storage systems; models of distributed computing. Fall. Anderson, Dewan, Jeffay, F.D. Smith.

244 ADVANCED PROGRAMMING LANGUAGES (3). Prerequisites, COMP 140 and 204. Semantics, application and implementation of several modern programming styles. Operational, axiomatic, denotational, and algebraic semantics. Programming with abstract data types. Functional, object-oriented, concurrent, and logic programming. (Alternate years.) Prins.

245 FUNCTIONAL PROGRAMMING (3). Prerequisite, COMP 144. Programming with functional or applicative languages. Lambda calculus; combinators; higher-order functions; infinite objects. Least fixed points, semantics, evaluation orders. Sequential and parallel execution models. (Alternate years.) Stanat, Magó.

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. (Alternate years.) Plaisted.


249 ADVANCED DISTRIBUTED SYSTEMS (3). Prerequisite, COMP 242 or 243. Advanced topics in designing distributed systems: interprocess communication; name and authentication services; distributed data; fault tolerance; application of theoretical results. Students design, implement, and test a large distributed system. (On demand.) F.D. Smith.


255 COMPUTER VISION (3). Prerequisite, COMP 254. Lecture and seminar on image display, restoration, enhancement, segmentation, and pattern recognition. Fall. Pizer, Coggins.

257 VISUAL SOLID SHAPE (MATH 278) (3). Prerequisites, MATH 33, 116. Differential geometry of three-dimensional shape; local and global shape properties; visual aspects of changing viewpoint and resolution. Taught largely through models and figures. Applicable to graphics, computer vision, human vision, and biology. (Alternate years.) Pizer, Coggins.

258 GEOMETRIC AND SOLID MODELING (3). Prerequisites, COMP 236, MATH 116, MATH 166. 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. Fall. Manocha.

265 ADVANCED COMPUTER ARCHITECTURE (3). Prerequisite, COMP 206. Machine languages-syntact and semantics; data representation, naming and addressing, arithmetic and logical operations; control structures; concurrency; input-output systems and devices. (Alternate years.) Brooks, Magó.

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 is 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 of alternate years. Marshall, Pizer, Burbeck.


286 DISCRETE OPTIMIZATION: ALGORITHMS AND COMPLEXITY (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.

291 PROFESSIONAL WRITING IN COMPUTER SCIENCE (3). Prerequisite, graduate major in computer science. Analysis of good and bad writing. Exercises in organization and composition. Each student also writes a thesis-quality short technical report on a previously approved project. Fall and spring. J. B. Smith, Weiss.

321 TECHNICAL COMMUNICATION IN COMPUTER SCIENCE (1). Prerequisite, graduate major in computer science. Seminar on teaching, short oral presentations, and writing in computer science. (Alternate years.) Brooks.

322 SEMINAR IN PROFESSIONAL PRACTICE (1). Prerequisite, satisfaction of M.S. Computer Science program requirements. The role and responsibilities of the computer scientist in a corporate environment 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.

324 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.

345 SOFTWARE ENGINEERING SEMINAR (0.5). Prerequisite, graduate student status in Computer Science. Technical and managerial strategies for organizing a project team and delivering a software product on time and within budget. Students in COMP 345 serve as external reviewers for projects undertaken in COMP 145. Spring. Stotts, Coggins.

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.

391 READING AND RESEARCH (1-3). Prerequisite, permission of the instructor. Directed reading and research in selected advanced topics. Fall and spring. Staff.

393 MASTER'S THESIS (0-6). Prerequisite, permission of staff. Fall and spring. Staff.

394 DOCTORAL DISSERTATION (0-6). Prerequisite, permission of staff. Fall and spring. Staff.

SCHOOL OF DENTISTRY

JOHN W. STAMM, Dean

Professors
Roland R. Arnold, Immunology, Host-Microbial Biology
Ikrumuddin Aukhil, Tissue Regeneration, Wound Healing
James W. Bawden, Enamel Formation, Fluoride
Stephen C. Buyné, Biomaterials, Clinical Research
James D. Beck, Oral Epidemiology
E. Jefferson Burke Jr., Oral Pathology
Miles A. Crenshaw, Biomaterialization
H. Garland Henley, Orthodontics
Harald Heymann, Operative Dentistry, Biomaterials
Ronald J. Hunt, Educational Policy
L. H. Hutcheson, Periodontology
Joyce W. Jenzano, Salivary Chemistry
Malcolm Johnston, Craniofacial Development
Robert P. Kusy, Orthodontics, Biomaterials/Biomechanics
William Maixner, Neurology, Pain Perception
Frank T. McIver, Pediatric Dentistry
Valerie Murrill, Oral Carcinogenesis, Salivary Gland Malignancies
Steven Offenbacher, Inflammatory Mediators, Host Response, Periodontal, Systemic Diseases
William Robert Profit, Orthodontics
Theodore Roberson, Operative Dentistry
Daniel A. Shugars, Health Services Research
David M. Simpson, Periodontology
John W. Stamm, Oral Epidemiology
Ronald F. Strauss, Medical Sociology and Health Promotion/Disease Prevention
Martin Trope, Endodontics
J. F. Camilla Tulloch, Orthodontics
Svein U. Tovend, Hormonal Regulation of Bone and Calcium Metabolisms
Timothy Turvey, Consequences of Craniofacial and Maxillofacial Surgery
William F. Vann Jr., Pediatric Dentistry
Donald W. Warren, Craniofacial Development and Dysfunction
Raymond P. White Jr., Oral Surgery Therapies
Ray Williams, Periodontology
J. Tim Wright, Mineralization and Development, Genetic Disorders
Mitsuyo Yamachi, Collagen Biochemistry, Physiology and Metabolism of Bone
John Zuniama, Nerve Injury and Regeneration

Associate Professors
L’Tanya Bailey, Orthodontics
Lyndon Cooper, Bone Cell Physiology, Implantology
Diane H. Dilley, Pediatric Dentistry
Greg Essick, Somatosensory and Motor Research
David A. Felton, Prosthodontics, Dental Implants, and Clinical Trials
Patrick Flood, Cellular Immunology, Immune Response and Regulation
Albert D. Guexes, Prosthodontics
Mark Katcher, Oral Medicine
John Ludlow, Oral and Maxillofacial Radiology
Sally Mauriello, Radiology, Geriatric Dentistry
Lauren Patton, Oral Medicine
Douglas R. McArthur, Prosthodontics
Glenn E. Minsley, Prosthodontics
John D. Moriarty, Dental Implants, Clinical Periodontology
Roy Peach, Histology
Jorge Perdigao, Operative Dentistry, Dental Materials
Michael W. Roberts, Pediatric Dentistry, Dental Lasers
Edward J. Swift, Dental Materials
Donald A. Tyndall, Oral and Maxillofacial Radiology
E. Leland Webb, Prosthodontics
Alldridge Wilder, Clinical and Laboratory Dental Materials Research
Rebecca S. Wilder, Dental Hygiene
Thomas Ziemiecki, Prosthodontics

Assistant Professors
Daniel Caplan, Oral Epidemiology
Nancy Chaffee, Prosthodontics
James M. George, Computer Technologies
David Paquette, Periodontology
Lisa Lang, Prosthodontics, Implantology
Linda Levin, Endodontics
Julian Moiseiwitsch, Dental Development, Pulpal Wound Healing
Debra Schiff-Sacco, Sleep Disorders, Endosseous Implants
Galen Schneider, Cell Adhesion, Intracellular Signaling, Bone Cell Biology, Tumorigenesis
Mark Scourias, Prosthodontics, Health Services Research
Diane Slugars, HIV and AIDS Pathogenesis, Virus-Host Cell Interactions
Asger Sigurdsson, Endodontics
Gary D. Slade, Oral Epidemiology
Jeffrey Thompson, Dental Materials
David Zajac, Craniofacial Disorders

Clinical Professor
Richard A. Beane, Orthodontics

Clinical Associate Professors
Carolyn Bentley, Oral Diagnosis
Dennis G. Hillenbrand, Oral and Maxillofacial Surgery
Ginger Mann, Educational Research
Vickie P. Overman, Dental Hygiene
Mary Pettiette, Endodontics
Enrique Platin, Oral and Maxillofacial Radiology

Clinical Assistant Professors
George H. Blakey, Oral and Maxillofacial Surgery, Anesthesia
Ronald J. Kulinski, Special Patient Care
Anthony Molina, Prosthodontics

Research Professors
James D. Bader, Health Services Research
Ceib L. Phillips, Biostatistics, Clinical Trials

Research Assistant Professors
Susi Lief, Craniofacial Related Anomalies, Periodontal and Systemic Diseases
Martin Kendal-Reed, Biological Psychology, Human Chemoreception

Graduate instruction in the School of Dentistry is offered in endodontics, operative dentistry, oral biology, oral and maxillofacial radiology, orthodontics, pediatric dentistry, periodontology, 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 writing the Office of Admissions, UNC-Chapel Hill School of Dentistry, CB# 7450, Chapel Hill, NC 27599-7450.

Tuition and Fees
Semester tuition and fees for residents total $1,771. The summer rate is $210. Instruments, books, and laboratory fees are to be determined. Nonresident tuition and fees total $6,902 per semester and $367 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 Multidisciplinary 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, comparisons of means and proportions, 2x2 and r x c tables, correlation and simple regression, sample size and power, analysis of variance, factorials 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: Hunt.

207 (OMSU) REGIONAL ANATOMY (3). Review of the anatomy of the head and neck region, including otocege, cardiovascular system, head and neck embryology, special sensory modalities, nervous system, functional nervous system, and extranoral 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, cardiologic issues 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. Sawyer.

233 (OBIO) TOPICS IN ORAL BIOLOGY (1). Introduces key concepts in oral biology, examines research methods used in oral biology research, and provides exposure to critical thinking. Summer. Arnold.

234 (OBIO) HOST ORAL PATHOGEN INTERACTIONS (2). Topics include oral ecology, oral microbiology, bacteriology, virology, and introduction to immunology. Fall. Arnold.

235 (OBIO) DIRECTED STUDIES IN ORAL PATHOGENS AND IMMUNITY (2). Topics include the molecular basis for pathogenicity of oral microorganisms, the molecular basis for the immune response, inflammatory processes, and autoimmunity. Spring. Shugars.

251 (OMSU) ADVANCED PAIN AND ANXIETY CONTROL (2). Introduction to operating room and recovery room protocol, patient cardiovascular and pulmonary evaluation, and anesthetics 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.

262ab (ORPA) ORAL AND MAXILLOFACIAL PATHOLOGY SEMINAR (2, 2). Fall topics include developmental disturbances of soft and hard tissues, syndromes, inflammation, immunology, pulpal and periapical 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. Burke.

301ab (DENG) INTERDISCIPLINARY CARE CONFERENCE I (1, 1). For first-year dental graduate students. Review and discussion of the diagnoses, treatment plans, prognoses, and interdisciplinary care of selected patients. Fall, spring. Hutchens.

302ab (DENG) INTERDISCIPLINARY CARE CONFERENCE II (1, 1). For second-year dental graduate students. Review and discussion of the diagnoses, treatment plans, prognoses, and interdisciplinary care of selected patients. Fall, spring. Hutchens.

320 (PERI) INTRODUCTION TO DENTAL IMPLANTS (1). The biological basis for dental implants, patient evaluation, diagnosis and treatment planning, prosthetic considerations, endosseous and transmandibular implants, and prosthetic considerations in complete edentulism and partial edentulism. Fall. Moriarty.

321 (PERI) CLINICAL IMPLANTOLOGY (2). Diagnosis and treatment planning implant-supported rehabilitation, using interdisciplinary interaction. Surgical placement of implants or restorative procedures using current systems. Spring. Moriarty.

Oral Biology

Program objectives are to train individuals for careers in research and teaching in areas related to oral biology. Ph.D. graduates will have the qualifications and research expertise to become productive faculty members at leading universities and senior scientists in various academic institutions or industrial settings.

Oral biology encompasses the study of the structure and function of normal and abnormal tissues of the oral cavity and related areas, as well as the study of disease and healing mechanisms specific to various oral conditions. The discipline of oral biology applies and extends the concepts of immunology, embryology, physiology, cellular and molecular biology, pharmacology, microbiology, and biochemistry to understanding the growth and development and pathologies associated with the oral cavity.

Attention in dental research and practice is now focusing on the dynamics of oral disease and prevention and treatment at the earliest stages of development, including research on risk factors for disease as well as the cellular and molecular events in disease pathogenesis. Molecular approaches for oral disease analysis and the complexity of disease elements require advanced training in the discipline of oral biology. Modern biomedical research is also identifying systemic relationship between oral conditions, health status, and diseases such as atherosclerosis, HIV, and cancer; the oral cavity also offers an ideal model to study biological structures and cellular mechanisms important throughout the body and important in immune response.

The UNC-Chapel Hill Oral Biology Ph.D. Program has three primary areas of emphasis: orofacial neurobiology, cellular and molecular biology of host-pathogens interactions, and the biology of extracellular matrices. These areas represent central concepts for study at advanced levels in the discipline of oral biology. Expertise and authority in these particular concepts are well represented within the strongest research and training qualifications of program faculty. Curricular requirements are based on training areas, with common core requirements for all students. Students begin with emphasis on basic sciences courses (cell biology and anatomy, microbiology, biochemistry) followed by examining specific biological applications. Research interests and qualifications such as DDS or MD will also determine course requirements. Participation in research in progress is a key element of the program, and students start laboratory rotations first semester to allow maximum time for research involvement.
Program participants will be involved early in their academic careers with certain of key research areas targeted by the National Institutes of Health for national scientific focus. In addition, UNC-Chapel Hill’s proximity and access to the Research Triangle’s unique blend of universities, private industry, and national scientific organizations offer a wealth of resources for scientific study, collaboration, and research development.

The Faculty and Their Research

Orofacial Neurobiology: Greg Essick, somatosensory and motor research; Mark Hollins, somatosensory and motor research; Edward F. Kelly, neural mechanisms; Martin Kendal-Reed, human psychophysiology, olfaction; Alan Light, neurobiological modulation of neural transmission; William Maixner, neurobiology, pain perception; Gerry S. Oxford, neural mechanisms; Aldo Rustioni, neurophysiology; Donald W. Warren, craniofacial development and dysfunction; John Zuniga, nerve injury and regeneration.

Biology of Host-Pathogens Interactions: Roland R. Arnold, immunology, host-microbial biology, secretory immunity; Patrick M. Flood, cellular immunology, immune response and regulation; Robert E. Johnston, viral pathogenesis; Thomas Kawula, bacterial pathogenesis; Steven Offenbacher, 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; Gerald Sonnenfeld, immune system, cell-mediated immunity; Christina Teng, human lactoferrin structure and function; Jenny Ting, molecular immunology, neuroimmunology, gene regulation; Roland Tisch, immunology and diabetes.

Biology of Extracellular Matrices: Ikramudden Aukhil, tissue regeneration, wound healing; James W. Bawden, enamel mineralization, fluoride; Lyndon Cooper, bone cell physiology, implantology; Miles Crenshaw, biomineralization; Philip Hirsch, hormonal regulation of calcium metabolism; Malcolm Johnston, craniofacial development; Gayle Lester, bone physiology; Lola Reid, stem cell differentiation and extracellular matrix interactions; Sven Toverud, hormonal regulation of bone and calcium metabolism; John Timothy Wright, mineralization and development, genetic disorders, extracellular matrices; Mitsuo Yamauchi, collagen biochemistry, physiology and metabolism of bone.

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

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 clefts and associated anomalies are acquainted with significant aspects of the deformities. Faculty on staff.

206 ab (OBIO) INTRODUCTORY ASPECTS OF PROTEIN CHEMISTRY (1). Prerequisite, permission 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 employed in oral biology. Participants analyze various topics in oral biology. 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. Course familiarizes students with a selection of specialized research techniques employed in interdisciplinary basic science approaches to problems of oral biology. Four lecture hours a week. Spring and summer. Faculty on staff.

210 abc (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. 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 instructor. Students discuss significant developments pertaining to the chemistry of molecular biology of structural proteins. Biochemistry of these proteins is correlated with their various functions. Critiques of current literature are emphasized. One lecture hour a week. Spring. Faculty on staff.

233 ab (OBIO) ADVANCED ORAL BIOLOGY (3, 2).
Prerequisites, 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. Fall and spring. Arnold, faculty on staff.

249 (OBIO) BIOLOGICAL CONCEPTS (3).
Overview of structures and biological determinants of conditions and diseases of the oral cavity; both growth and development and pathophysiology will be introduced in the context of three areas of oral biology: biology of extracellular matrices, host-pathogen interactions, and oral neurobiology. Prerequisite for OBIO 250-252. 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. Yamashita, faculty on staff.

251 (OBIO) OROFACIAL NEUROBIOLOGY (3).
An overview of normal human orofacial sensation and function, evaluation of orofacial sensory and motor capacities, orofacial pain mechanisms, and neural control of orofacial behaviors. Lectures, literature review, discussions, seminars. Spring. Essick, faculty on staff.

252 (OBIO) HOST-PATHOGEN 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. Fall. Floody, faculty on staff.

280 ab (OBIO) THE MOLECULAR AND CELLULAR PATHOGENESIS OF INFLAMMATORY DISEASES (6).
Prerequisites, 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, and specific inflammatory conditions, and the immunopharmacology of inflammation. Lecture, seminar. Fall (a), spring (b). Oral Biology faculty. (Course director: Offenbacher.)

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 requirements 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 science. 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**

207 (OMSU) REGIONAL ANATOMY (2 or more). Lecture, laboratory. Montgomery.

212 abcd (OMSU) ORAL AND MAXILLOFACIAL SURGERY-ADVANCED ORAL AND MAXILLOFACIAL SURGERY (12).
Faculty on staff (Dental School and UNC Hospitals).

214 abcd (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 surgery 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. Burkes.

263 (ORPA) ORAL PATHOLOGY AND HISTOPATHOLOGY II (2). Spring. Burkes.

301 (OMSU) RESEARCH (6). To be arranged.

320 (DENT) INTRODUCTION TO DENTAL IMPLANTS (1). Lectures and seminars on use of dental implants. Fall. Moriarty, Hillenbrand.

393 (OMSU) THESIS (3 or more).

400 (OMSU) GENERAL REGISTRATION (0).

**Oral Radiology**

The advanced education program in Oral 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 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 teacher training preparation. Each student participates in an extensive research project.

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 Board of Oral and Maxillofacial Radiology.

Applications should be submitted by April 1. Interviews are usually scheduled before final acceptance.

**Graduate Courses in Oral Radiology**

162 (RADI) RADIOPHIC IMAGING (4). Fall. Burns.

190 (ORAD) COMPREHENSIVE RADIATION BIOLOGY (3). A survey of the biological effects of ionizing and non-ionizing radiations ranging from the molecular to the ecosystem levels. Related topics such as the medical effects of nuclear war and radiation hormesis are also included. Fall. (Alternate years.) Tyndall.

201 (ORAD) PRINCIPLES OF MEDICAL AND HEALTH PHYSICS (2). Students review and discuss the physics of medical and dental radiology in terms of the type of radiation used and the information yielded from various diagnostic modalities. Radiation health physics is also included. Fall. Tyndall.

202 (ORAD) ADVANCED ORAL RADIOLOGIC TECHNOLOGY (4). Seminars, laboratory, and clinical sessions to provide experience in advanced oral radiologic procedures. Spring. Platin, faculty on staff.

203 (ORAD) ADVANCED ORAL RADIOGRAPHIC DIAGNOSIS (3). Literature review and seminars to present advanced radiologic diagnosis. Fall. Tyndall, staff.

204 (ORAD) ADVANCED RADIOLOGIC DIAGNOSIS (3). Literature review, seminars, and clinical experience in advanced radiologic diagnosis. Summer. Ludlow, faculty on staff.

205 (ORAD) PRINCIPLES FOR ADVANCED DIAGNOSTIC AND THERAPEUTIC RADIOLOGY (4). Literature review and seminars in the application of radiologic procedures such as computer tomography, computed tomosynthesis, and magnetic resonance for diagnosis of oral and maxillofacial conditions. Fundamentals of radiation therapy are also included. Tyndall, faculty on staff.

206 (ORAD) ADVANCED ORAL RADIOLOGY I (2). Lecture and seminars in advanced radiology topics. Spring. Tyndall, faculty on staff.

207 abedef (ORAD) GRADUATE CLINICAL ORAL RADIOLOGY (3, 3, 3, 3, 3, 3). Fall, spring, summer (first year); summer, fall, spring (second year). Tyndall, faculty on staff.

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 abedef (ORAD) CLINICAL RADIOLOGY CONFERENCE (1). 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, faculty on staff.

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.

263 (ENVR) RADIATION HAZARDS EVALUATION (1). Spring. Watson.

(RDEN) SCI COMPUTING/LAB (2). Fall. George.

(RDEN) RESEARCH METHODS (1). Fall. Wright.


203 (RDEN) APPLIED RESEARCH METHODS (2) Fall. Hunt.

**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 October and 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 later 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. Proffit, 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. Beane, faculty on staff.

205 abcd (ORTH) ADVANCED CLINICAL ORTHODONTICS (5, 3, 7, 7, 3). Fall, spring, summer. Beane, faculty on staff.

206 (ORTH) BIOMECHANICS (2). Mechanical principles in orthodontic force production and control; biological response to orthodontic force. Fall. Kusy, Proffit.

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.

208 (ORTH) GROWTH AND DEVELOPMENT (4). Principles of growth and development, emphasizing dento-facial development from an evolutionary and molecular biology perspective as well as the traditional anatomical perspective. Spring. Kula, 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. Dilley.

213 (ORTH) PRINCIPLES OF ORTHODONTIC TREATMENT FOR ADULTS (2). Orthodontic treatment procedures for adults; for AEOD, periodontic, 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. Summer. Proffit.

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. Proffit, Phillips.

302 ab (ORTH) CURRENT TOPICS IN ORTHODONTICS (2, 2). Seminars on pertinent orthodontic literature for advanced orthodontic students. Fall, spring. Proffit.

393 (ORTH) THESIS (3 or more).

Pediatric Dentistry

The postdoctoral training 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, NW, Suite 101, Washington, DC 20036. All candidates must register with the Postdoctoral Dental Matching Program, 595 Bay Street, Suite 300, Toronto, Ontario, Canada MSG 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 Master of Science degree. All students completing the program must submit a thesis. The program length is thirty-six months, beginning July 1. The program's goal is to prepare the student for a career in dental education or clinical practice. 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, institutional or 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 SEMINARS IN PEDIATRIC DENTISTRY (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 abdef 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 with 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.
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 and 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. Christensen.

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 Master of Science degree. 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. 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 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 the Dental Admissions Office, UNC-Chapel Hill School of Dentistry, Chapel Hill, NC 27599.

All application materials should be submitted by November 1 for the following summer class beginning July 1. A personal interview is required.

The Graduate Program in Periodontology is currently a thirty-six month course of study in fixed and removable prosthetics, dental implant prosthodontics, and maxillofacial prosthetics 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 Periodontology**

250 abc (PERI) ADVANCED CLINICAL PERIODONTICS CLINICAL PRACTICE (9). 405 hours. Fall, spring, summer. Faculty on staff.

251 abc (PERI) ADVANCED CLINICAL PERIODONTICS CLINICAL PRACTICE (9). 405 hours. Fall, spring, summer. Faculty on staff.

266 abc (PERI) PERIODONTAL THERAPY (1,1,1). Fall, spring, summer. Faculty on staff.

268 abcd (PERI) CASE ANALYSIS (10). Fall, spring, summer. Faculty on staff.

270 abc (PERI) SEMINAR IN PERIODONTOLOGY (6). Review of literature. Fall, spring, summer. Faculty on staff.

271 ab (PERI) SEMINAR IN PERIODONTOLOGY (4). Review of literature. Fall, spring. Faculty on staff.

285 (PERI) OCCLUSION AND OCCLUSAL DYSHARMONIES (2). Spring. Faculty on staff.

301 abcdef (PERI) RESEARCH (5 each). Up to 1,350 laboratory hours. Arranged. Fall, spring, summer. Faculty on staff.

320 (PERI) INTRODUCTION TO IMPLANTS (2). Fall, spring. Faculty on staff.

321 (PERI) CLINICAL IMPLANTOLOGY (2). Spring. Faculty on staff.

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 the Dental Admissions Office, UNC-Chapel Hill School of Dentistry, Chapel Hill, NC 27599.

All application materials should be submitted by November 1 for the following summer class beginning July 1. A personal interview is required.

The Graduate Program in Prosthodontics is currently a thirty-six month course of study in fixed and removable prosthodontics, dental implant prosthodontics, and maxillofacial prosthetics 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 abcdef (PROS) PROSTHODONTIC PRINCIPLES, DIAGNOSIS, AND TREATMENT PLANNING-FIXED AND REMOVABLE (2, 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 (third year). Director, faculty on staff.
232 abedefg (PROS) ADVANCED CLINICAL FIXED AND REMOVABLE PROSTHODONTICS (1, 3, 3, 5, 5, 5, 3, 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 abde (PROS) MAXILLOFACIAL PROSTHODONTIC PRINCIPLES, DIAGNOSIS, AND TREATMENT. (1, 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, fall, spring (third year). Minsley, faculty on staff.

234 abdef (PROS) CLINICAL MAXILLOFACIAL PROSTHODONTICS (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). Minsley, faculty on staff.

235 abdefg (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.

236 (PROS) DENTAL MATERIALS (2). A seminar designed to study the composition, physical properties, and manipulative procedures for the numerous materials and products relative to prosthodontics. Fall (first year). 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 opportunities 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 Master of Science degree. The program is designed to prepare candidates for careers in academices, 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 methodology; and development and completion of a research project.

Enrollment is limited to ten candidates each year. The course of study begins July 1.

**Graduate Courses in Endodontics**

210 abde (ENDO) ADVANCED CLINICAL ENDODONTICS (29). 870 hours of clinical practice. Faculty on staff.

211 abdef (ENDO) ENDODONTICS SEMINAR AND CASE ANALYSIS (15). 180 hours conference. Faculty on staff.

212 abef (ENDO) ENDODONTICS LITERATURE REVIEW SEMINAR (20). 270 hours. Faculty on staff.

215 abef (ENDO) ENDODONTICS CURRENT LITERATURE REVIEW (5). Seminar. Faculty on staff.

220 abdef (ENDO) RESEARCH (15). 675 hours of laboratory. Faculty on staff. Required each semester.

393 THESIS (3 or more). Third year.

400 GENERAL REGISTRATION (0).

**Core Courses Required:**

201, 202, 203 (DENG)

206 (ORAD)

207 (ANAT)

210 (DECO)

220 (OMSU)

233 (OBIO)

235 (OBIO)

250-251 (OMSU)

**Dental Hygiene Education**

The primary objective of the Dental Hygiene Education Master of Science program is to prepare well-qualified educators for dental hygiene programs. At the successful completion of this program, the student should be able to (1) give evidence of having acquired advanced knowledge and skills in one of the following minors: Dental Management/Administration, Dental Radiology, Science Basic to Dental Hygiene Education, Oral Pathology, and Clinical Education, (2) develop the knowledge, skills, and attitudes necessary in the conduct of dental hygiene programs, (3) teach courses in more than one dental hygiene field, (4) define their own problems from the present body of knowledge in dental hygiene education, solve the problems, and present their work in a scholarly fashion.

Credit hour requirements vary and are based on the individual background of the student and on the minor selected by the student. Thirty-one to thirty-four credit hours are required in the core (including thesis or research) and three credit hours of electives in allied areas are also required. The length of the program is approximately two years. Minimum admissions requirements for the program include current licensure and a bachelor's degree from an accredited institution and graduation from a dental hygiene program accredited by the Commission on Dental Accreditation, American Dental Association. Work experience in dental hygiene education or dental hygiene practice is strongly recommended.

Applicants must have a grade point average of B or better in the professional undergraduate curriculum. Three letters of recommendation are required as well as completion of an admissions questionnaire by the applicant. The course of study begins
July 1. An application to the University can be obtained by writing to the Admissions Office, School of Dentistry, CB# 7450, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7450. For further information contact Coordinator, Dental Hygiene Education Program, School of Dentistry, CB# 7450, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7450, (919) 966-2800.

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 allied education. Summer. Mann.

120 (DHED) EDUCATIONAL CONCEPTS (2). Summer. Mann.

136 (DHED) CLINICAL/LABORATORY TEACHING PRACTICUM (2). Fall. Mauriello.

160A (DHED) SEMINAR IN EDUCATION AND RESEARCH (1). Fall. Wilder.

160B (DHED) SEMINAR IN EDUCATION AND RESEARCH (1). Fall. Wilder.

230 (DHED) ORGANIZATION AND ADMINISTRATION (3) Spring. Overman.

237 (DHED) INTERNSHIP (6-9) Spring. Overman.

393 (DHED) THESIS (3). Spring. Wilder.

201 (DENG) RESEARCH DESIGN (1). Fall. Wright.


203 (DENG) APPLIED PHARMACOLOGY (2). Fall. Hunt.

210 (DENG) SCIENTIFIC COMPUTING (2). Fall. George.

ELECTIVE (3).

Additional courses are required for each minor as follows:

Biological Sciences

102 (DENT) GROSS ANATOMY (4). Montgomery.

104 (DENT) MICROSCOPIC ANATOMY (4). Peach.

114 (DENT) PHYSIOLOGY (4). Glasser.

Clinical Education

153 (DHED) ADVANCED INTRAORAL FUNCTIONS (3). Wilder.

154 (DHED) ADVANCED INTRAORAL FUNCTIONS (PERIODONTICS) (3). Wilder.

236 (DHED) ADVANCED/CLINICAL TEACHING (3). Mauriello.

Dental Radiology

190 (ORAD) COMPREHENSIVE RADIATION BIOLOGY (1-2 variable).

162 (RADI) RADIOGRAPHIC IMAGING I (4). Burns.

233 (DHED) SEMINAR AND PRACTICUM IN DENTAL RADIOLOGY EDUCATION (4). Overman.

Management/Administration

474E (DHED) PERSONNEL MANAGEMENT SEMINAR (2). Wilder.

234 (DHED) DENTAL MANAGEMENT SEMINAR (4). Wilder.

ELECTIVE (3).

Oral Pathology

104 (DENT) MICROSCOPIC ANATOMY (4). Peach.

127 (DENT) PATHOLOGY I (3). Burkes.

202 (DENT) PATHOLOGY II (2). Burkes.

Department of Dramatic Art

MILLY S. BARRANGER, Chair

Professors

Milly S. Barranger (21) Dramatic Theory/Criticism and Theatre History
David Hammond, Acting, Directing
Robert A. Owen (2) Costume Design and History
Bonnie N. Raphael, Voice and Speech
Craig W. Turner, Movement for the Actor

Associate Professors

Anne M. Coble, Design
Raymond Dooley, Acting
Adam N. Versenyi, Dramaturg

Adjunct Associate Professor

Judith L. Adamson, Costume Production

Adjunct Assistant Professor

Kenneth J. Lewis, Design, Technical Production

Adjunct Instructor

Penny P. Smith

Lecturers

Michael J. Roffetti, Technical Production
Jeff A. R. Jones, Costume Production

The Department of Dramatic Art offers professional training programs in acting, costume production, and technical production leading to the Master of Fine Arts degree. Facilities for these programs include the historic Playmakers Theatre, the production facilities of the Graham Memorial Building, the Paul Green Theatre, and the Center for Dramatic Art.

Each student is responsible for becoming familiar with the general regulations of the Graduate School and particularly with the dates indicated on the calendar for the academic year; this information is contained elsewhere in the Graduate School Record. Please note that students in the Department of Dramatic Art are frequently required to work on productions during University scheduled vacations.

A limited number of graduate appointments are available in the department. Appointments are presently awarded in the areas of acting, technical production, costume production, and in support of the Introduction to Theatre courses (DRAM 15,
16, and 35). All appointments involve instructional or laboratory supervisory responsibility.

**Master of Fine Arts**

**Purpose.** Through disciplined classroom training and a progressive involvement in performance opportunities, students in the M.F.A. programs are challenged to develop the skills and attitudes that enable them to compete in the professional theatre. Stressing accomplishment in a wide range of performance 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, the graduating student can perform a variety of roles or responsibilities on 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 costuming and technical areas, applicants are required to submit portfolios. All acting candidates must audition. In addition to on-campus auditions, the department holds auditions each February in New York, Chicago, and San Francisco. 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 work. Letter grades (H, P, L, F) 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. In the first two years, candidates carry twelve credit hours per semester, and in their third year, six credit hours per semester. 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, 105 Graham Memorial, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3230.

**Courses for Graduates and Advanced Undergraduates**

100 TECHNICAL DIRECTION (3-6). Prerequisite, Dramatic Art 64, section II, or equivalent technical practice in theatre production, and permission of the instructor. Study of the technical and engineering problems in production and standard theatrical drafting and construction conventions. Must be taken fall and spring. Lewis, 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 for the stage with studio productions of selected works. May be repeated once for credit. (B.A. perspective credit.) Spring. Huey.

157 PLAYWRITING (3). Prerequisite, at least one semester of Dramatic Art 155. A practical course in the 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. Lewis.

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 practicum 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. Coble, Jones.

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. Lewis.

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 years.) Coble.

170 SURVEY OF COSTUME HISTORY (3). A survey of historic 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). Course includes subjects in the aesthetics of costume design and history as related to the organization and construction of theatrical costumes. May be repeated for credit. Spring and fall. Adamson, Jones.

173 COSTUME CONSTRUCTION I (Var. 1-3). Prerequisite, permission of the instructor. Instruction in pattern making through flat drafting and draping, as well as fitting and construction techniques as applicable to theatrical costuming. Fall. Adamson.

174 COSTUME CONSTRUCTION II (Var. 1-3). Prerequisite, Dramatic Art 173 or permission of the instructor. Continuation of instruction and construction techniques begun in Drama 173. 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 stylistic 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 years.) Coble. (B.A. Aesthetic perspective credit.)

177 PRINCIPLES OF DESIGN (3). Studies and practicum in the fundamentals of design as applied to the visual arts with emphasis on theatrical design. (B.A. Aesthetic perspective credit.) Fall. Coble.

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.) Smith.

192 SPECIAL STUDIES (1-3). 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.

194 PROFESSIONAL THEATRE LABORATORY (3-12). 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.

Courses for Graduates

200 SEMINAR IN PROFESSIONAL PRACTICE (1-3). Prerequisite, admission to the M.F.A. program in Dramatic Art. An examination of professional theatre practice through contact with students, staff, faculty, and visiting artists in all areas of theatre. Must be taken fall and spring. May be repeated for credit. Adamson, Lewis, Jones.

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. 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. Dooley, Hammond.

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 acting 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 acting 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 174 or admission into the M.F.A. Costume Production program. Theatrical pattern making for period garments for the stage. Fall. Adamson.

243 COSTUME CONSTRUCTION IV (1-3). Prerequisite, Dramatic Art 242 or admission into the M.F.A. Costume Production program. Techniques of tailoring theatrical costumes. Spring. Adamson.

244 COSTUME CONSTRUCTION V (1-3). Prerequisite, Dramatic Art 243 or admission into the M.F.A. Costume Production program. Construction of costumes for period productions and techniques supplemental to those topics in Dramatic Art 243. Fall. Adamson.

245 ADVANCED COSTUME DESIGN I (3). Prerequisite, admission to the second year of the M.F.A. Costume program. Projects explore rendering techniques through assigned plays and periods. Fall. Coble.

246 ADVANCED COSTUME DESIGN II (3). Prerequisite, Dramatic Art 245. Further exploration of complicated design assignments through history, continuing to refine rendering techniques. Spring. Coble.

247 COSTUME LABORATORY III (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.
249 COSTUME PROGRAM INTERNSHIP (6-12). Intensive practicum in costume design and construction, with tutorial and class assignments on an individual basis as required. Must be taken fall and 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. Rolieri.

251 M.F.A. TECHNICAL THEATRE PRACTICUM I (3-6). Prerequisite, admission into the M.F.A. Tech program. Practical work in scene shop. Must be taken fall and spring. Rolieri.

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 scene shop. Must be taken fall and spring. Rolieri.

259 TECH INTERNSHIP (6-12). Intensive practicum in production projects for departmental and PlayMakers Repertory Company productions, with independent studies as assigned on an individual 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. Rolieri.

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. Lewis.

393 THESIS (1-6). Staff.

400 GENERAL REGISTRATION (0).

CURRICULUM IN ECOLOGY

BRUCE P. WINTERHALDER, Chair

Professors
Richard N. Andrews (32) Environmental Policy and Planning, Impact Assessment
Douglas J. Crawford-Brown (43) Environmental Risk Assessment
J. Alan Feduccia (3) Ecology and Evolution of Vertebrates
Mark E. Hay (34) Marine Ecology, Chemical Ecology, Plant-Herbivore Interactions
John D. Kasarda (9) Human Ecology, Urban Sociology
Melinda Meade (36) Human Ecology, Demography, Ecology of Third World Development
Charles H. Peterson (29) Marine Ecology, Intertidal Communities
Frederic K. Pfander (27) Environmental Microbiology, Estuarine Pollution
Peter J. Robinson (17) Climatology, Future Climates, Climatic Impacts
Alan E. Striven (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
John W. Florn (33) Population and Medical Geography
Paul W. Leslie (40) Human Ecology, Demographic Anthropology, Population Genetics

Assistant Professors
David W. Penning (44) Ecology and Evolution
Thomas M. Whitmore (42) Cultural Ecology, Latin America, Population

Research Professor
Richard E. Bilsborough (4) Economic Demography, Population, Development and the Environment

Professors Emeriti
Nelson G. Highton
Richard J. Kopec
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 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. The department is actively involved in projects in Ecuador, Brazil, Colombia, Kenya, and Eastern Europe. Strong
ecological faculties and research programs are available in sister institutions at NCSU and Duke University, and members of these faculties may serve on students' 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, zooology, 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 degrees.

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 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 in the fall semester in which they enroll, and each student must take one ECOL 199 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 ECOL 199 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 nine credit hours in each of the principal and supporting research areas. Master of Arts students must register for ECOL 393. 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 may be prepared (ECOL 203) in place of a master's thesis (ECOL 393).

Minor in Ecology

Master's Candidates

Graduate majors in other programs who wish to declare an ecology minor may do so by taking ECOL 190 and/or ECOL 199 and ECOL 201 and the additional approved ecology courses selected from the core listing in the Graduate Record necessary to meet the requirements of the Graduate School. A member of the faculty of the Curriculum in Ecology must be represented on the student's advisory committee.

A master's candidate must take a minimum of nine semester hours of course work in the minor area. The appropriate courses for each student must be agreed to by both the student's advisory committee and department and the Curriculum in Ecology. Courses taken for the minor may not be the same courses used to fulfill major course requirements. Both the major and minor departments must give the Graduate School written approval for the program.

Students wishing to minor in ecology should notify both their major department and the curriculum within the first year of their enrollment. The final written and oral examinations cover course work for both the major and the minor.

Ph.D. Candidates

Graduate majors in other programs who wish to declare an ecology minor may do so by taking ECOL 190, ECOL 199, and ECOL 201 and the additional approved ecology courses selected from the core listing in the Graduate Catalog necessary to meet the requirements of the Graduate School. A faculty member of the Curriculum in Ecology must be represented on the student's advisory committee.

A Ph.D. candidate must take a minimum of fifteen credit hours of course work in the minor area. The appropriate courses for each student must be agreed to by the student's advisory committee and department and the Curriculum in Ecology. Courses
taken for the minor may not be the same used to fulfill major course requirements. Both the major and minor departments must give the Graduate School written approval for the program.

Students wishing to minor in ecology should notify both their major department and the curriculum within the first year of their enrollment. The written and oral exams cover course work for both the major and the minor.

**Ecology Core Areas**

(Detailed descriptions are found under the department that offers each course.)

**Natural Sciences**

Anthropology 117, 203, 204, 260
d Biology - All Biology courses listed below under "Biology"

Environmental Sciences and Engineering 132, 133, 134, 137, 191, 198, 238, 321, 324

Geography 114, 115, 116, 144, 145, 173, 177, 190, 191, 192, 205, 210, 277, 290, 303, 308, 309, 314

Marine Sciences - All Marine Sciences courses listed below under "Marine Sciences"

Epidemiology 160

**Social Sciences**

Anthropology 139, 255, 260

City and Regional Planning 124, 244,

Economics 111, 165, 265

Environmental Sciences and Engineering 153, 283, 284

Geography 132, 134, 145, 150, 245

Sociology 212, 213, 218, 287

**Courses in the Ecology Curriculum**

190 CONSERVATION AND SUSTAINABLE DEVELOPMENT (3). Fall. Reice, 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 (2). Topics and problems in ecological research. May be taken more than once. Two hours a week. Staff.

202 FIELD EXPERIENCE IN ECOLOGY (2). Organized field work in remote environments with a faculty instructor as approved by student's supervisory committee. May be taken more than once. Staff.

203 MASTER OF SCIENCE PAPER (3). Fall or spring. Staff.

250 SPECIAL TOPICS IN ECOLOGY (2-4). Prerequisite, permission of the instructor. Fall and spring. Staff.

300 RESEARCH IN ECOLOGY (2 or more). Fall or spring. Staff.

393 MASTER OF ARTS THESIS (3-6). Fall or spring. Staff.

394 DOCTORAL DISSERTATION (3 or more). Fall or spring. Staff.

400 GENERAL REGISTRATION (0).

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. Winterhalder.

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.) Winterhalder.

266 SEMINAR IN ETHNOBOTANY (3). Spring. Staff.

**Biology**

114 AVIAN BIOLOGY (3). Fall. (Alternate years or on demand.) Feduccia, Niley.

126 OCEANOGRAPHY (3). Fall. Neumann; spring, staff (MASC).

132 EVOLUTIONARY MECHANISMS (3). Spring. (Alternate years.) Burke, Pfennig, Stiven.

140 BIOLOGICAL OCEANOGRAPHY (4). Summer (Alternate years.) Staff (MASC).

142 PLANT ECOLOGY (4). Fall. (Alternate years.) Peet.

143 ECOLOGICAL PLANT GEOGRAPHY (3). Spring. (Alternate years.) Peet.

145 EXPERIMENTAL METHODS IN ECOLOGY AND EVOLUTION (3). Spring. (Alternate years.) Stiven.

147 FIELD ECOLOGY (4). Fall or spring. (Alternate years.) Reice, staff.

150 ANIMAL SOCIETIES AND COMMUNICATION (3). Spring. (Alternate years.) Wiley.

151 BEHAVIORAL ECOLOGY (3). Spring. (Alternate years.) Pfennig.

184 CONSERVATION BIOLOGY (3). Spring. White.

185 POPULATION ECOLOGY (3). Fall or spring. (Alternate years.) Stiven.

185L LABORATORY IN POPULATION ECOLOGY (same as BIOL 185).

186 COMMUNITY AND SYSTEMS ECOLOGY (3). Fall or spring. Reice.

186LLAB IN COMMUNITY AND SYSTEMS ECOLOGY (same as BIOL 186).

195 FIELD BIOLOGY AT HIGHLANDS BIOLOGICAL STATION (1-4). Summer. Staff.

213 ADVANCED MARINE ECOLOGY (3). Spring. Staff of IMS.

247 FIELD PLANT GEOGRAPHY (2). Spring. (Alternate years.) Peet.

255 SEMINAR IN ECOLOGY (2). Fall and spring. 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.
BIOSTATISTICS
164 SAMPLE SURVEY METHODOLOGY (3). Spring. Kalsbeek.
170 DEMOGRAPHIC TECHNIQUES I (3). Fall. Suchindran, Bilsborrow.

CITY AND REGIONAL PLANNING
124 URBANIZATION AND PLANNING IN THE THIRD WORLD (3). Fall. Lacey.
244 DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT (3). Fall. Kaiser.

ECONOMICS
111 RESOURCE AND ENVIRONMENTAL ECONOMICS (3). Fall and spring. Staff.
165 ECONOMICS OF POPULATION (3). Fall or spring. Turchi.
265 ECONOMICS AND POPULATION (3). Spring. Turchi.

ENVIRONMENTAL SCIENCES AND ENGINEERING
132 LIMNOLOGY AND WATER POLLUTION (4). Spring. Staff.
134 ECOLOGICAL MICROBIOLOGY (3). Spring. Pfander.
137 ECOLOGY OF WETLANDS (4). Fall. Staff.
153 ENVIRONMENTAL MANAGEMENT AND POLICY (3). Fall. Andrews.
191 HEALTH AND ECOLOGICAL EFFECTS OF ENVIRONMENTAL AGENTS (3). Fall. EHS Staff.
198 BIOPHYSICAL THEORY OF ENVIRONMENTAL HEALTH (3). Fall. Crawford-Brown.
238 MICROBIAL DEGRADATION OF XENOBIOTICS (3). Fall of even-numbered years. Aitken and Pfander.
283 NATURAL RESOURCE LAW AND POLICY (3). Fall. Heath.
284 WATER RESOURCES PLANNING AND POLICY ANALYSIS (3). Spring. Moreau.
324 CHEMISTRY OF HUMIC SUBSTANCES (1). Fall. Christman.

EPIDEMIOLOGY
160 PRINCIPLES OF EPIDEMIOLOGY (3). Fall and spring. Shy, Alexander, Moe.

 GEOGRAPHY
114 PHYSICAL CLIMATOLOGY (3). Konrad, Robinson.
116 APPLIED CLIMATOLOGY (3). Konrad, Robinson.
132 THE WORLD'S FOOD SUPPLY (3). Meade, Hawley.
144 LANDSCAPE BIOGEOGRAPHY (3). Staff.
145 MEDICAL GEOGRAPHY (3). Meade.
150 POPULATION GEOGRAPHY (3). Flavin, Meade, Whitmore.
173 GEOGRAPHIC INFORMATION AND ANALYSIS (3). Walsh, Moody.

177 INTRODUCTION TO REMOTE SENSING AND DIGITAL IMAGE PROCESSING (3). Walsh.
190 QUANTITATIVE METHODS IN GEOGRAPHY (3). Gesler, Konrad.
191 TECHNICAL ISSUES IN GEOGRAPHIC INFORMATION SYSTEMS (3). Moody, Walsh.
192 APPLIED ISSUES IN GEOGRAPHIC INFORMATION SYSTEMS (3). Moody, Walsh.
205 ADVANCED QUANTITATIVE METHODS IN GEOGRAPHY (3). Gesler.
210 ADVANCED PHYSICAL GEOGRAPHY (3). Staff.
245 GEOGRAPHY AND A CROWDING WORLD (3). Meade.
277 ADVANCED REMOTE SENSING: SATELLITE IMAGE PROCESSING (3). Walsh, Moody.
290 SPATIAL ANALYSIS AND COMPUTER MODELING (3). Gesler, staff.
303 SEMINAR IN GEOGRAPHIC INFORMATION SYSTEMS (3). Walsh.
308 SEMINAR IN PHYSICAL GEOGRAPHY (3). Konrad, Robinson, Walsh.
309 SEMINAR IN MEDICAL GEOGRAPHY (3). Meade, Gesler.
314 SEMINAR IN CLIMATOLOGY (3). Staff.

MARINE SCIENCES
101 OCEANOGRAPHY (3). Fall, Neumann; spring, staff.
104 BIOLOGICAL OCEANOGRAPHY (4). Summer. (Alternate years.) Staff.
106 PHYSICAL OCEANOGRAPHY (4). Fall. Bane.
125 COASTAL SEDIMENTARY ENVIRONMENTS (3). Spring. (Alternate years.) Wells.
146 MARINE ECOLOGY (3). Spring. (Alternate years.) Peterson, Hay.
199 SPECIAL TOPICS IN MARINE SCIENCES (2-4). Fall, spring, or summer. Staff.
215 MARINE MYCOLOGY (6). On demand at IMS. Kohlmeier.
216 MARINE PHYCOLOGY (5). Fall. (Alternate years.) Hommesand.

SOCIOLOGY
212 DEMOGRAPHY: THEORY, SUBSTANCE, TECHNIQUES, PART I (3). Rindfuss, Uhlenberg, Entwisle, Harris.
213 DEMOGRAPHY: THEORY, SUBSTANCE, TECHNIQUES, PART II (3). Rindfuss, Uhlenberg, Entwisle.
218 HUMAN ECOLOGY (3). Nielsen, J. Blau.
287 MIGRATION AND POPULATION DISTRIBUTION (3). (On demand.) Uhlenberg.
DEPARTMENT OF ECONOMICS

DAVID K. GUILKEY, Chair

Professors
John S. Akin (1) Health Economics, Public Finance, Human Resources
Arthur Berman (3) Macroeconomic Theory
Stanley W. Black (53) International Monetary Theory
David M. Blau (61) Labor Economics
William A. Darity Jr. (54) Economic Development, Monetary Theory
James W. Friedman (60) Microeconomic Theory, Industrial Organization
Richard T. Froyen (7) Macroeconomics, Monetary Policy
A. Ronald Gallant (73) Econometrics
Robert L. Gallman (8) Economic History
David K. Guilkey (39) Econometrics
James L. Murphy (21) Econometrics
Steven S. Rosefielde (26) Comparative Economic Systems
Michael K. Sala (38) Macroeconomics, Monetary Economics
John F. Stewart (36) Industrial Organization
Vincent J. Tarascio (30) History of Economic Thought
Helen V. Tauchen (40) Microeconomic Theory

Associate Professors
Gary A. Biglaiser (63) Microeconomic Theory, Industrial Organization
Claudio Mezzetti (71) Microeconomic Theory
Thomas A. Mroz (68) Labor Economics
William R. Parke (65) Econometrics
Paul W. Rhode (69) Economic History
Boone A. Turchi (31) Demography
James A. Wilde (34) Public Finance

Assistant Professors
Evan Anderson, Macroeconomics
Donna B. Gilleskie, Health Economics, Econometrics
Miguel Herce (72) Econometrics
Alexander Kovalenkov, Microeconomic Theory, General Equilibrium
Koleman S. Strumpf (74) Public Finance

Professors Emeriti
Dennis R. Appleyard
James C. Ingram
Clifton H. Kees
David McFarland
Thomas J. Orsagh
Ralph W. Pfouts

The Department of Economics, located in Gardner Hall, offers programs leading to the degrees of Master of Science and Doctor of Philosophy.

The three-million-volume Davis Library includes substantial collections in economics for both research and instructional purposes. The Business Administration and Social Sciences Division of the Davis Library is organized to serve the library needs of students and faculty of the Department of Economics and School of Business Administration. This division contains more than five hundred fifty current scholarly, trade, and other journals in economics and business, as well as a selected collection of important books and important business services. The Davis Library is a depository of the publications of the federal government and the United Nations. These collections, along with the unique collection of state publications, constitute basic research materials of special value to economics. Through mutual cooperative arrangements, the collections of the Duke University Library are available to faculty and graduate students in the Department of Economics. The Department of Economics offers excellent computer facilities. A personal computer lab and remote terminal facilities for the main computer center are available in the Economics building.

Master of Science

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, and three electives. 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. In addition to course work, the thirty-credit-hour program includes a research paper and a master's exam.

Doctor of Philosophy

Students seeking the doctorate in economics must offer a minimum of fifteen courses distributed as follows:

The Fundamentals of Economics. The following eight courses or their equivalent are required: Economics 200, 201, 202, 203, 210, 235, 251, and 271. At least one econometrics course is required as well.

The Areas of Concentration. The student must select two areas of concentration from among the following fields:

- Comparative Economic Systems
- Industrial Organization
- Econometrics
- International Economics
- Economic Development
- Economic History
- Health Economics
- Microeconomic Theory
- History of Economic Thought
- Monetary and Financial Economics
- Labor Economics
- Population Economics
- Public Finance

At least three courses must be taken in the major field of concentration and two courses in the minor field.

Supporting Courses. The remaining courses are supporting courses chosen by the student in consultation with the director of graduate studies in Economics. The courses should be chosen to give greater background and scope to the areas of concentration and may be selected from within the Department of Economics as well as from other departments in the University.

Experience in Research and Teaching. As part of the requirements for the degree each candidate is expected to perform at least two semesters of service in teaching and research.

Foreign Languages-Research Skill. Additionally, the candidate must either demonstrate competence in one foreign language or fulfill a research skill requirement. The research skill may be chosen from among mathematics, statistics, or computer
science. The skill requirement is satisfied by successful completion of two courses approved by the director of graduate studies in Economics.

**Fellowships and Assistantships**

Teaching and nonteaching fellowships and a number of assistantships and instructorships are available to graduate students in economics. Detailed information regarding these fellowships, assistantships, and instructorships may be obtained from the director of graduate studies in Economics.

**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** (3). Analysis of the ways consumers and business firms interact in a market economy. Fall and spring. Staff.

101 **INTERMEDIATE THEORY: PRICE AND DISTRIBUTION** (3). Prerequisites: Economics 10 and Mathematics 22 or equivalent. The determination of prices and the distribution of income in a market system. Fall and spring. Staff.

111 **RESOURCE AND ENVIRONMENTAL ECONOMICS** (3). Prerequisite: Economics 100 or 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. Staff.

120 **LOCATION AND SPACE ECONOMY** (3). Prerequisite, Economics 100 or 101 or permission of the instructor. The course is designed to provide the student with an understanding of the effects of space on economic and social activity. Fall. Staff.

122 **URBAN ECONOMICS** (City and Regional Planning 122) (3). Prerequisite, Economics 100 or 101 or permission of the instructor. The course explores the urban problems facing us today: unorganized growth; disparate land uses; fiscal crisis; the ghetto; poverty; employment; housing; and transportation inadequacies; and crime. Fall or spring. Staff.

130 **MONEY, THE FINANCIAL SYSTEM, AND THE ECONOMY** (3). Analysis of the role of money in the economy, its creation and management, institutional setting, policy implications, and interrelationships with other variables in determining the level of economic activity. Students may not receive credit for both Economics 130 and 132 or for both Economics 130 and 135. 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. Gallman, Rhode.

137 **REVISIONIST ECONOMIC HISTORY** (3). A critical evaluation of recent controversies in economic history, concentrating on methods but attending as well to the main reinterpretations offered by economic historians. Spring. Gallman.

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. Gallman, Rhode.

140 **INTRODUCTION TO PUBLIC FINANCE** (Political Science 211) (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. Akin, Strumpf, Wilde.

141 **ANALYSIS OF PUBLIC FINANCE** (3). Prerequisite, Economics 100 or 101. Application of economic analysis to the taxing and spending functions of government. Students may not receive credit for both Economics 140 and 141. Fall and spring. Akin, 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. Akin, Strumpf, Wilde.

145 **PUBLIC POLICY TOWARD BUSINESS** (3). Prerequisite, Economics 100. 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. Biglaiser, Stewart.

148 **ADVANCED TOPICS IN INDUSTRIAL ORGANIZATION AND SOCIAL CONTROL** (3). Prerequisite, Economics 145 or 147. Theory of market failure and its relationship to antitrust and regulatory policy; exploration of empirical literature of industrial organization; current issues in social control. Biglaiser, Stewart.

150 **INTRODUCTION TO HEALTH ECONOMICS** (3). Prerequisite, Economics 100 or 101. An economic analysis of the production and distribution of health care. Fall or spring. Akin, Gilkeskie.

151 **TRANSPORTATION ECONOMICS** (3). Application of economic principles to transportation topics such as pricing and regulation, the public provision of transport services, the relationship between transport cost and location. Fall or spring. Tauchen.


159 **HISTORY OF ECONOMIC DOCTRINES** (3). A survey of the fundamental forms of economic thought from the scholastics through Keynes. Fall or spring. Tarascio.

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. Spring. Black.

161 **INTERNATIONAL ECONOMICS** (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.

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, Durity, Field.
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, Durity, Field, Willis.

165 ECONOMICS OF POPULATION (3). 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.

166 CRIME AND CRIMINAL JUSTICE: AN ECONOMIC APPROACH (3). Prerequisite, Economics 10 or permission of the instructor. The application of economic theory and methodology to the determination of criminal behavior and the societal response to that behavior. Spring. Staff.


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. Gallant, Guilkey, Herce, Murphy, Parke.

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.

181 TOPICS IN MICROECONOMIC THEORY (3). Prerequisite, Economics 100 or 101. A treatment of topics in microeconomic theory not normally covered in Economics 100 or Economics 101. Friedman, Mezetti.

182 TOPICS IN MACROECONOMIC THEORY (3). Prerequisite, Economics 130 or 132. This course emphasizes theoretical and empirical topics such as growth, labor search, Phillips curves, stagflation, and optimal government policy. Salemi.

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. Froyen, Parke, Salemi.

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, Willis.


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, Willis.

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, Willis.

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, Economics 101 or equivalent. Theory of utility and demand; brief review of perfect competition; theories of imperfect competition. Fall. Friedman, Tauchen.

201 ADVANCED MICROECONOMIC THEORY II (3). Prerequisite, Economics 200 or equivalent. Advanced theory of utility and demand; continuation of imperfect competition; brief treatment of methodology; of input-output methods, and of welfare economics. Spring. Friedman, Mezetti, Tauchen.

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. Benavie, 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. Spring. Staff.

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. Mezetti, Tauchen.

221 GAME THEORY (3). Prerequisite, Economics 200, 201, or permission of the instructor. Topics in game theory with emphasis on those results of special interest for economics: n-person noncooperative games, multiperiod games, and cooperative games including the core, bargaining models, and value solutions. Fall. Friedman.

222 PRODUCTION THEORY AND MODELLING (3). Prerequisite, 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. Fall or spring.

224 DYNAMIC MODELS IN MICROECONOMICS (3). Prerequisite, 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. Fall or spring. Tauchen.
225 ECONOMICS OF INFORMATION (3). The microeconomics of uncertainty and information, including behavior under uncertainty, insurance, moral hazard, signaling, auctions and bidding, contracts, and search theory. Spring or fall. Biglaiser, Mezetti.


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. Akin, Strumpf, Wilde.

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. Fall. Akin, Strumpf, Wilde.

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. (Alternate years.) Spring. Biglaiser, Stewart.

248 ECONOMIC REGULATION OF INDUSTRY (3). Economic regulation in theory and practice. Principles of optimal regulation are developed, and regulatory policy in various industries is appraised. Fall. Biglaiser, Stewart, Tauchen.

250 HEALTH ECONOMICS (3). Prerequisite, equivalent of Economics 188. Demand analysis, manpower planning and location models, health indexes, production functions, health and the labor force, the structure of the health services market, hospitals and the nonprofit firm, and cost-benefit analysis. Spring. Akin, Roswell.

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. Spring. Tarascio.

252 HISTORY OF ECONOMIC THOUGHT II (3). A study of economic doctrines from the nineteenth century to the present in a methodological perspective. Fall. Tarascio.


255 HEALTH ECONOMICS FOR DEVELOPING COUNTRIES (3). Prerequisite, Economics 250 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. 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.

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. Turchi.

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. Fall. Rosefield.


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. Guilkey, Hercz, Mroz, Parke.

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. Guilkey, 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, Hercz, 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.

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. Spring. Froyen, Waud.

LABOR ECONOMICS I (3). Prerequisite, Economics 200 or permission of the instructor. An 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 micro-economic effects of marriage, fertility, and mobility on labor supply, as well as the macroeconomic effects of unemployment on inflation. Fall or spring. Blau, Mroz.


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.

SEMINAR IN MICROECONOMIC THEORY I (3). Prerequisites, Economics 200 and 201. Seminar study of advanced topics in microeconomic theory. Spring. Friedman.

SEMINAR IN MACROECONOMIC THEORY II (3). Prerequisites, Economics 202 and 203. Seminar on advanced topics in macroeconomic theory. Fall. Benavie, Salemi, Waud.

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. Salemi, Tauchen.

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. Fall or spring. Gallman, Rhode.

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. Fall or spring. Akin, Strumpf, Wilde.

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. Fall or spring. Tarascio.

RESEARCH IN HEALTH ECONOMICS (3). Prerequisites, Economics 250 and 255. Seminar on advanced topics in health economics. This 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. Spring. Akin, Gilleskie.

SEMINAR IN INTERNATIONAL ECONOMICS (3). Prerequisites, Economics 261 and 262 or equivalent. A directed reading and research course. Fall or spring. Black, Conway, Hagwara.

SEMINAR IN ECONOMIC DEVELOPMENT (3). Prerequisite, Economics 262 or equivalent. Directed reading and research on selected problems in economic development. Fall or spring. Conway, Darity, Field.

SEMINAR IN POPULATION (3). Prerequisite, graduate standing in economics. For advanced population students, this course addresses the newest and most advanced economic demography literature. Fall. Turchi.


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.

SEMINAR IN MONETARY ECONOMICS (3). Prerequisite, permission of the instructor. Advanced study of theoretical and applied topics in monetary economics. Fall or spring. Beravie, Froyen, Salemi, Waud.

SEMINAR IN PORTFOLIO MANAGEMENT (Business Administration 386) (3). Prerequisite, permission of the instructor. Development, testing, and economic effects of models for determining the selection of assets. Fall or spring. Staff.

SEMINAR IN FINANCIAL MARKETS (Business Administration 388) (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. Fall or spring. Staff.

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. Fall or spring. Blau, Mroz.

MASTER'S THESIS (Variable, 0-3). Fall and spring. Staff.

DOCTORAL DISSERTATION (Variable, 0-3). Fall and spring. Staff.

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. Fall. Rosefield.

SEMINAR. Prerequisite, permission of the instructor. Individual research in a special field under direction of a member of the department. Fall and spring. Staff.

GENERAL REGISTRATION (0).

SCHOOL OF EDUCATION
MADELEINE R. GRUMET, Dean

Professors
J. Hunter Ballow (003) Mathematics Education, Curriculum and Instruction
John C. Brantley (009) Psychoeducational Assessment, Professional Decision Making
Duane Brown (014) Elementary School Counseling, Center Development, Behavioral Consultation
Frank Brown (013) Policy Studies, School Law, Leadership and Administration
William I. Burke (015) Teacher Education, Curriculum and Instruction
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. Galassi Jr. (028) Counseling Psychology, Behavior Therapy, Counseling College Students and Adults
James J. Gallagher (029) Child Development, The Gifted Child, Public Policy in Education
Madeleine R. Grumet (170) Curriculum Theory
R. Sterling Hennis Jr. (039) English Education, Curriculum and Instruction
Paul B. Hounshell (042) Science Education, Curriculum and Instruction
Richard C. Hunter (043) School Administration
David L. Lillie (048) Individualized Instruction, Learning Disabilities, Technology Applications in Education
Catherine Marshall (105) Politics; Qualitative Inquiry; Gender, Race, and Class Issues
James L. Morrison (056) Educational Planning, Evaluation, Policy Analysis
George W. Noblit (057) Sociology of Education, Qualitative Research Methods, Educational Leadership
Sam Odom (168) Child Development and Family Study
William S. Palmer (059) English Education
Walter B. Przywansky (064) School Psychology, Consultation, Learning Disabilities
Rune J. Simeonsson (073) Exceptional Child Development, Psychological Assessment, Primary Prevention
Dixie Lee Spiegel (075) Reading and Language Arts
Donald J. Steedman (076) Program Planning and Evaluation, Child Development
Gary B. Stuck (079) Educational Psychology, Learning, Evaluation
Alan R. Tom (136) Teacher Education
Gerald Unks (082) Social Foundations of Education
William B. Ware (085) Educational Statistics, Research Design Analysis
Kinnard P. White (089) Educational Psychology, Measurement and Evaluation

**Associate Professors**

Harriet A. Boone (149) Early Intervention, Family Support and Ethics
Linda Brooks (012) Counseling Psychology, Career Development/Counseling, Sexual Harassment
Susan Friel (115) Mathematics Education
Wallace H. Hannum (034) Instructional Design, Theories of Instruction, Computer Applications
Audrey L. Heining-Boynton (037) Foreign Language Education, Curriculum and Instruction
M. Gail Jones (047) Science Education, Middle Grades Education, Gender Issues in Education
Judith L. Meece (055) Human Development
Dwight L. Rogers (067) Early Childhood/Elementary Education, Moral Development, Teachers as Reflective Practitioners
Lynda Stone (140) Philosophy of Education, Social Theory, Feminism

**Assistant Professors**

Leslie M. Babcock (149) School Interventions, Models of Risk and Resilience
Richard A. Brice (011) Early Childhood Education
Jane M. Danielewicz (134) The Teaching of Writing, The Writing Process, Relationships Between Speaking and Writing
Marjorie H. DeWitt (143) Special Education, Technology and Education
Valerie Jarvis (152) Multicultural and Antibus Education, Teacher Practices, Teacher Education
Ryuko Kubota (169) Foreign Language Education
Carol E. Malloy (157) Influence of Culture on Mathematical Problem-Solving, Gender and Equity Issues
William W. Malloy (130) Educational Leadership, Special Education
Xue Lan Rong (146) Social Studies Education, Social Foundations of Education, Large Data-Set Research

**Research Professors**

Donald B. Bailey Jr. (002) Early Intervention, Family Support, Assessment
Charles C. Bullock, Special Education
H. Dickson Corbett, Social Foundations
Thelma Harms (035) Early Childhood Education
Mark Wolery, Special Education
David E. Yoder (094) Special Education, Emergent Literacy, Special Needs Persons

**Research Associate Professors**

Deborah Bender, Child Development and Family Studies
Donna Bryant, Special Education
Richard M. Clifford (111) Public Policy, Early Education and Care, Public Finance
Research Assistant Professors
Virginia Buisse (159) Community-Based Programs for Young Children with Disabilities and Their Families
Robert A. McWilliam (140) Early Intervention for Children with Disabilities

**Adjunct Assistant Professor**

Michael Bigby (158) Crisis Intervention in Schools, Attention Deficit Disorder

**Clinical Professors**

Donald A. Boulton (007) Student Personnel, Higher Education
David D. Dill, Educational Leadership
Roy A. Edelheit (022) Teacher Education; Curriculum; Teaching
Kenneth G. Jens (045) Learning, Memory, and Suggestibility of Persons with Disabilities, Early Intervention
Bobbi B. Lukker (049) Special Education, Epidemiology of Language Disorders in Exceptional Children
Thomas L. McKeon (106) Continuing Education, Higher Education
Jerry D. Weast (122) Educational Leadership, Educational Research
Clarence N. York (153) Special Education

**Clinical Associate Professors**

Mary Ruth Coleman (143) Learning Disabilities and Gifted Education
John W. Edgerly (023) Counseling Psychology
Suzanne A. Gulpidge (033) Social Studies Education
Perry Harrison (165) Educational Leadership
Gail S. Huntington, Special Education
Robert C. Kanoy III (103) Educational Psychology, Educational Reform, Evaluation
Gerry Madrazo (166) Science Education
Howard Maniloff (110) Educational Leadership
Russell J. Rowlett (068) Mathematics Education
Timothy R. Sanford (070) Institutional Research, Higher Education
Ralph D. Wenger (088) School Psychology
Rhonda M. Wilkerson (117) Strategies for Teaching to Learning Style Differences
Pamela J. Winton (092) Families, Early Intervention, Preservice and Inservice Training

**Clinical Assistant Professors**

Patricia S. Bowers (135) Middle School Preparation, Elementary Science Leadership Training, Science and Gender Issues
Cynthia Copolo, Curriculum and Instruction
Lynette Darke, School Psychology
Stephen R. Hooper (040) School Psychology, Child Neuropsychology, Child Psychopathology
Daniel M. Huff (102) Teacher Socialization, Teacher Preparation, Choral Music Education
Todd Hultman, School Psychology
Glen A. Martin (051) Counseling Psychology
Sharon P. Maskel (052) Special Education
Kelly Maxwell, School Psychology
Mary Penta (171) Educational Psychology
Annette Perot, School Counseling
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 associate dean for academic programs, who is also director of graduate studies. In addition, Dean Grumet is assisted by the associate dean for students, and the associate dean for outreach and director of the Center for Educational Leadership.

Degree Programs

The School of Education offers the following master's degrees: (1) the Master of Arts in Teaching (M.A.T.), with majors in English, French, German, Latin, mathematics, music, science, social studies, and Spanish; (2) the Master of Arts (M.A.) in Curriculum and Instruction, Educational Psychology, School Counseling, School Psychology, and Special Education; (3) the Master of Education (M.Ed.) in Elementary Education, Middle Grades Education, Educational Psychology, School Counseling, School Psychology, and Special Education; and (4) the Master of School Administration (M.S.A.) in School Administration. The Graduate School administers all but the Master of School Administration program, which is administered by the School of Education.

Two doctoral degrees in education are offered: (1) the Doctor of Philosophy (Ph.D.) in Education (with the following research areas: Culture, Curriculum and Change; Early Childhood, Families, and Literacy; and Psychological Studies), and in School Psychology; and (2) the Doctor of Education (Ed.D.) in Curriculum and Instruction and in Educational Leadership. The Ph.D. education programs and the Ed.D. in Curriculum and Instruction are administered by the Graduate School while the Ed.D. in Educational Leadership program is administered by the School of Education.

Degree requirements for the Master of School Administration (M.S.A.) degree and Doctor of Education (Ed.D.) in Educational Leadership are outlined in the School of Education Record.

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, it recommends licensure candidates from the following University degree programs: the Division of Speech and Hearing Sciences, the School of Information and Library Science, and the School of Social Work.

The nondegree Teacher Licensure Program, operated in conjunction with the Office for Continuing Studies, provides a route to licensure for persons with degrees in certain very limited fields.

Requirements for North Carolina teacher licensure may be found in the School of Education Record.
Education Degree Requirements

Beyond the Graduate School requirements for the Ph.D., the School of Education also requires the following:

- Full-time enrollment required until all formal course work is completed.
- Completion of the school's research requirements for doctoral students, which are: Fundamentals of Educational Research: Qualitative and Quantitative Methods (EDFO 390-1), Statistical Analysis of Educational Data (EDFO 180), and Foundations of Educational Research (EDFO 390-2), and Proseminar in education in the first year; and in the second year and/or third year, six credits of additional research course(s), and four semesters of supervised research. Appropriate/relevant options for the six credits in year two or three will be determined by each Ph.D. program. Other specialty and elective courses will be determined by the student's program of studies committee.

In addition to the M.A. and Ph.D., the School of Education offers through the Graduate School the M.Ed., the M.A.T., and the Ed.D. degrees. The requirements for these degrees follow:

Master of Education

The following requirements represent the minimum required for M.Ed. degrees:

1. A bachelor's degree from an accredited institution.
2. A minimum of thirty semester hours in advanced course work.
   If the student selects a minor field, twenty-one to twenty-four hours typically are taken in the School of Education and six to nine hours are taken in the department of the minor.
3. At least two full semesters of residence and completion of thirty semester hours of credit are required to meet residence requirements.
4. All work credited toward the degree must be completed within five years.
5. A major in the School of Education.
6. A written comprehensive examination in the major field must be satisfactorily completed.
7. The option of submitting a thesis for three to six semester hours in the major field, in which case there is a final oral examination on the thesis.
8. Application for admission to candidacy for the master's degree; the degree application card to be filed no later than the date specified in the Graduate School Calendar of Events.

Master of Arts in Teaching

Following are the minimum requirements for the Master of Arts in Teaching:

1. A bachelor's degree from an accredited institution.
2. The equivalent of an undergraduate major in the chosen subject area.
3. Modern foreign languages candidates must have completed and filed their score for the American Council on the Teaching of Foreign Language (ACTFL) Oral Proficiency Interview (OP).
experience in their field, and must have assumed or expect to assume responsibility for planning and developing education programs. The program is organized around the following areas: curriculum design and development; instruction; measurement and evaluation; organizational development; and a specialization area. Specific objectives are:

- To describe curriculum design models; develop rationale, goals, and objectives for a curriculum; select appropriate strategies for meeting goals; describe historic and contemporary trends in curriculum;
- To describe and analyze instructional methods; describe instructional design models; describe procedures for developing an instructional system;
- To describe basic principles of measurement, describe techniques for evaluating instruction and assessing students’ performances; and
- To analyze an organization in terms of its mission or characteristics; identify and demonstrate group leadership techniques.

Program graduates plan, design, and offer education and training programs while working in a variety of settings, such as community colleges, medical centers, schools of dentistry and nursing, international foundations, and ministries of health and/or education in developing countries.

**Admission Requirements**
- A degree with a 3.0 grade point average in the junior and senior years;
- A competitive Graduate Record Examination score;
- Three letters of recommendation;
- A statement of goals;
- Work experience in the field.

Note: Meeting these minimum requirements does not ensure admission.

**Program Requirements**

Students take six courses in the required areas of the program and may opt to pursue an additional area of specialization. All students must complete a thesis and written and oral examinations.

**Core Courses and Experiences**
- Curriculum Design and Development
  EDCI 200, EDCI 303
- Instruction
  EDCI 211, EDCI 265
- Measurement and Evaluation
  EDFO 106, EDFO 288

**Additional Courses and Experiences**

Students may wish to pursue additional knowledge and/or skills by taking three courses related to one of the following areas: curriculum and instruction, educational development, medicine/dentistry, nursing, and public health. The student and appropriate advisers will agree on the specification of objectives for specialization.

**Educational Psychology Master of Education (M.Ed.) and Master of Arts (M.A.)**

The master’s program in Educational Psychology is a thirty-hour program leading to either the M.A. or M.Ed. degree. The M.A. requires the completion of a thesis and an oral defense; the M.Ed. does not. The program prepares its graduates to 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: EDFO 101.

**Core Courses and Experiences**
EDFO 180, EDFO 201, EDFO 202, EDFO 206, EDFO 285

**Specialty Courses and Experiences (in addition to the core courses and experiences)**

Students complete the program with a series of elective courses (at least fourteen hours), which must include one course in each of the areas of learning and development.

**Elementary Education Master of Education (M.Ed.)**

The Elementary Education master’s degree (M.Ed.) is a program that prepares individuals to become successful teachers and/or curriculum specialists in schools for kindergarten children through grade six. Candidates must complete thirty-six semester hours of course work including a required core of twelve semester hours in the foundations of early childhood education and child development, twelve semester hours of instructional area specialization, and twelve semester hours of electives designed to support the student’s career goals and intermediate level competency. At least six of the thirty-six hours must include coursework in supporting areas such as anthropology, sociology, speech communication, library science, and maternal health and child care.

Program graduates receive North Carolina graduate-level licensure K-6.

**Requirements**

**Prerequisites**

Students must hold teaching licensure in Elementary Education in order to be considered for admission. Applicants with three or more years of teaching experience receive preference.

At the time of the printing of this document, the program requirements were under revision.
School Counseling Master of Education (M.Ed.) and Master of Arts (M.A.)

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. It 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.

Every attempt is made to integrate theory with practice throughout the training program and to provide the ethical, legal, and professional perspectives needed to become a professional counselor. Upon completing the School Counseling program, students are eligible for North Carolina Advanced Graduate licensure as school counselors.

Requirements

Students in the M.Ed. program typically complete the course work in fourteen months, beginning and ending with summer study.

Core Courses and Experiences
EDSP 200, EDSP 201, EDSP 202, EDSP 203, EDSP 204, EDSP 205, EDSP 206, EDSP 207, EDSP 209, EDSP 210, EDSP 226, EDSP 223

Specialty Courses and Experiences (in addition to the core courses and experiences)
Students must take nine hours of graduate-level electives. Three of these hours must be in human development.

School Psychology Master of Education (M.Ed.) and Master of Arts (M.A.)

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 program prepares individuals to work in schools and related educational agencies. Graduates are eligible for psychological and educational licensing in North Carolina.

Requirements

Prerequisites

Applicants should enter the program with course work in personality theory, abnormal psychology, statistics, learning theories, and developmental psychology. Missing prerequisites are added to the program of study.

Core Courses and Experiences
EDFO 180, EDSP 210, EDSP 221, EDSP 222, EDSP 223, EDSP 226, EDSP 227, EDSP 228, EDSP 325, EDFO 393

Specialty Courses and Experiences

Four foundation courses are also required, as are concurrent supervised field experiences across fall and spring sessions. Practica and externships are coordinated with course work to integrate learning with field experiences in the public schools. Twelve hundred hours of externship are accumulated, which are the equivalent of an internship spent concurrently with course work.

Secondary Education Master of Arts in Teaching (M.A.T.)

The Master of Arts in Teaching (M.A.T.) program offers graduate preparation for prospective teachers of English, Latin, mathematics, science, and social studies in grades 9-12, and prepares teachers of foreign languages (French, German, or Spanish), and music for grades K-12. The program provides opportunities for students to accomplish three general objectives:

- Expand their content specialization in methodology;
- Gain understanding of curriculum and instruction primarily at the secondary level (in foreign languages and music, there is a K-12 subject area focus); and
- Provide knowledge of the social and social psychological foundations of education.

This program prepares candidates for initial teaching licensure in North Carolina.

Requirements

Applicants

Requirements for admission include a completed bachelor's degree from an accredited institution, the equivalent of an undergraduate major in one of the subject areas indicated, Graduate Record Exam (GRE) verbal and quantitative scores, a UNC-Chapel Hill Graduate School Application completed and on file, and a list of verified experiences working with young people. Modern Foreign Languages candidates must have completed and filed their score for the American Council on the Teaching of Foreign Language (ACTFL) Oral Proficiency Interview (OPI). Applicants should call (800) 486-5444 and identify themselves as UNC-Chapel Hill applicants.

Individual subject areas may have additional requirements or prerequisites. Interested candidates may wish to contact the specific subject area advisor.

Core Courses and Experiences

The Master of Arts in Teaching degree is a twelve-month, full-time, school-based, student-centered program. It relies on partnerships between public schools and the university and uses realities of the classroom as the motivation for students to connect theory and practice.
Summer I (second session):
Introduction to Teaching
Introduction to Schools

Fall Semester:
Clinical Placements
Subject Area Methods
Contexts of Schooling
Learners and Learning
Subject Area Course
MAT Seminar

Spring Semester:
Clinical Placements
Subject Area Methods
Contexts of Schooling
Learners and Learning
MAT Seminar

Summer II (first session):
Contexts of Schooling
Learners and Learning
MAT Seminar

Clinical placements will include multiple settings and levels 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.
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 will help teachers to 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 will focus 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.

Special Education: Early Childhood Intervention and Family Support Master of Education (M.Ed.)
The Special Education master's degree program in early childhood intervention and family support gives the student the basic skills to work with infants and preschoolers with and without disabilities and their families. The program's view of early childhood intervention is based on several philosophical assumptions: a) early childhood intervention must be viewed from an ecological perspective, b) it should be family centered, c) it should be normalized, and d) it is an interdisciplinary endeavor and should be treated as such.
Upon completing the M.Ed. program and licensure criteria, students become eligible for North Carolina graduate-level licensure in birth-kindergarten.

Requirements
Applicants with teaching credentials and experience who work with young children receive priority for admission. The M.Ed. program is a thirty-three credit-hour program; thirty hours of course work are taken in the required core classes. The remaining three hours can be chosen from a variety of elective courses. In three intensive practicum settings, students learn skills related to working with young children ages birth to five with and without disabilities and their families. In addition, they develop skills in consultation and program administration.

Core Courses and Experiences
EDSP 230, EDSP 232, EDSP 235, EDSP 242, EDSP 340,
EDSP 342A, EDSP 342B, SPHS 347

Additional Courses and Experiences (in addition to the core courses and experiences)
Possible elective courses offered for students:
SPHS 361, CHCH 206, CHCH 220, SOWO 223, SOWO 224, SOWO 234, NURS 186

Special Education: Learning Disabilities
Training Program Master of Education (M.Ed.)
The learning disabilities program offers three degrees of training for individuals:

Level I - Classroom Teachers. Prepares teachers to provide effective instruction, with support, for students with specific learning disabilities who are assigned to their classes.


Level III - Master's Degree Program with an Emphasis in Specific Learning Disabilities. Prepares students for leadership roles at the school-building level.

Requirements
The program requires that applicants have an A-level license in a teaching area. Applicants with teaching experience who work with exceptional children receive priority for admission. Admissions for Levels I and II are processed through Continuing Education. Admissions for Level III are processed through the Graduate School.
Typical Sequence of Core Courses and Experiences

Level I - Classroom Teachers
EDSP 231, EDSP 247, EDSP 322

Level II - Add-On License (Level I plus nine hours)
EDSP 340 (6 hours), EDSP 224

Level III - Master's Degree* (Levels I and II plus following courses):
EDSP 143, EDSP 224, EDSP 240, EDSP 248, EDSP 340 (3 hours)

*Twenty-four semester hours must be taken after admission to the Graduate School.

Curriculum and Instruction Doctor of Education (Ed.D.)

The Ed.D. program in Curriculum and Instruction prepares curriculum-instruction specialists who will be leaders in elementary and secondary schools (pre-K-12). Applicants are admitted on the basis of their potential for outstanding contributions to education in that area. They should hold a master's degree in a field of education.

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 specialist in advising administrators, teachers, and other professional personnel. Responsibilities include curriculum development, instruction, and staff development.

The Ed.D. program emphasizes planning, implementing, and evaluating programs in early childhood and elementary/middle grades/secondary schools. This field-oriented program provides graduates with the expertise to lead creatively in a variety of settings. Students in the Ed.D. degree program are expected to complete an extensive professional internship that allows them to apply concepts and principles of curriculum and instruction in institutional settings. The Ed.D. degree program fulfills the licensure requirements for curriculum-instructional specialists at the doctoral level.

Requirements

Students in the Ed.D. program in Curriculum and Instruction complete seventy-two to seventy-five hours of course work in the two areas of curriculum determinants and theory and research. It is anticipated that students will have completed an additional thirty to thirty-three hours at the master's level. Eighteen of these hours may meet the requirement in specialization areas at the doctoral level.

Core Courses and Experiences

Curriculum Determinants

The Learner (choose six hours total)
EDFO 201, EDFO 202, EDSP 242
Social/Culture Theory (six hours)

Choose one organizational theory course: EDSP 290 A and B, EDSP 291, EDSP 288, EDCL 294, EDSP 284, or EDSP 286
Choose one course in the context of education:
EDFO 220, EDFO 222, EDFO 223, EDFO 224, or EDFO 242

Knowledge (fifteen hours)

Students choose a specialization area from which they elect to take fifteen hours. Approved cognate areas include the following: early childhood, elementary, middle grades, and secondary education (English, math, social studies, science, foreign languages, and music).

Additional Courses and Experiences

Theory, Practice, and Research

Theory and Practice (twenty-one hours)
EDCI 115, EDCI 209, EDCI 210, EDCI 211, EDFO 106, or EDFO 206, EDCI 303, EDCI 306 (field replacements)

Research Core (fifteen hours)

Research requirements are consistent with the requirements for the Ed.D. in the School of Education, and also include Seminar III in Curriculum and Instruction and Seminar IV, a research apprenticeship.

Research requirements include quantitative, qualitative, and critical/theoretical analysis courses as selected by the student and doctoral committee, i.e., ANTH 175, ANTH 176, ANTH 225, ANTH 297, PSYC 136, PSYC 239, PSYC 337, BIOS 124, BIOS 164.

Curriculum and Instructional Research (twelve hours)
EDCI 303 Doctoral Seminar I, EDCI 303 Doctoral Seminar II, EDCI 297, EDCI 306

Education Doctor of Philosophy (Ph.D.)

The School of Education offers a Ph.D. in Education with three major research areas. Those areas are: 1) culture, curriculum, and change; 2) early childhood, family, and literacy studies; and 3) psychological studies in education. All Ph.D. students will be required to enroll in a required research core of twelve-fifteen credit hours (six of which will be determined by the student in consultation with his/her committee), plus a seminar in education. The remaining courses and experiences in this fifty-credit hour program will be determined by the student and his/her doctoral committee. Students in the Ph.D. program are required to enroll full-time, with the expectation they will graduate in three to four years.

Focuses of the three research areas are:

Culture, Curriculum and Change

This area focuses on the study of educational change and reform utilizing perspectives derived from curriculum studies, educational policy, and social foundations.
Early Childhood, Family, and Literacy Studies
A common interest in the development of children and families link the fields of early childhood education, early intervention for children with disabilities, and emergent and beginning literacy.

Psychological Studies in Education
This area brings together the fields of educational psychology, special education, counseling, and technology.

Requirements
Prerequisites
Master's degree or evidence of equivalent graduate work in education or related fields.

Core and Specialty Courses
Proseminar in education
Educational Research Methods (EDFO 390-1)
Theoretical Foundations of Research (EDFO 390-2)
Statistical Analysis of Educational Data (EDFO 180)
(if necessary)
Two additional research courses
Four semesters of supervised research
Seven electives, as determined by the research area
Research area seminar
Minimum of six hours of dissertation credit

Research requirements are consistent with the research requirements for the Ph.D. outlined in the Graduation Requirements section of this record.

Educational Leadership Doctor of Education (Ed.D.)
The doctoral program in Educational Leadership develops senior administrative leaders for the schools of North Carolina and the nation. The program prepares educational leaders to confront changing state and local needs and challenges.

Requirements
The Ed.D. in Educational Leadership requires sixty-one to sixty-four credit hours of study, including twenty-four hours in the major, twelve cognate hours, thirteen to sixteen hours of research methodology courses, six hours in an internship/internship seminar, and six dissertation hours. Program requirements include an initial twelve-month period of study in residence as a cohort member.

Major Courses (twenty-four hours)
EDSP 287, EDSP 288, EDSP 291, EDSP 293, EDSP 296, EDSP 297, EDSP 298, EDSP 299

Cognate (twelve hours)
Each student will be required to choose four courses that create a coherent area and enhance the substantive expertise of the student. If the student has insufficient background in curriculum and instruction, the cognate must be developed in curriculum and instruction.

Research
Research requirements are consistent with School of Education research requirements for the Ed.D. are outlined in the Graduation Requirements section of this record.

Internship (six hours)
EDSP 391

Dissertation (six hours)
EDFO 394

School Psychology Doctor of Philosophy (Ph.D.)
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.

Requirements
Prerequisites
Applicants should enter the program with course work in personality theory, abnormal psychology, statistics, learning theories, and developmental psychology. Missing prerequisites are added to the program of study.

Core Courses and Experiences
EDFO 180, EDFO 206, EDFO 280, EDFO 380, EDFO 390-1, EDFO 390-2, EDSP 210, EDSP 221, EDSP 222, EDSP 223, EDSP 226, EDSP 227, EDSP 228, EDSP 229, EDSP 283, EDSP 320, EDFO 394

Research requirements are consistent with the research requirements for the Ph.D. outlined in the Graduation Requirements section of this record.

Specialty Courses and Experiences
Courses in foundation areas and evaluation are also required. Concurrent field-based experiences are coordinated with course work to develop increasingly more complex skills. A full-time internship is also required.

Course Offerings
School of Education course offerings are categorized under five headings: Child Development and Family Studies (CDFS); Education (EDUC); Curriculum and Instruction (EDCI);
Educational Foundations (EDFO); and Specialized Professional Education (SPED). Courses numbered 100 to 199 are open to qualified advanced undergraduate students and to graduate students, and courses numbered 200 and higher are open only to graduate students.

Some of the graduate courses in education are available in one or both of the two sessions of the summer school. See the Summer School Catalog for details.

**Courses for Advanced Undergraduates and Graduate Students**

**EDUC 100 EDUCATION WORKSHOPS (1-3).** Prerequisite, permission of the director of Professional Development Schools. Workshops designed around education topics primarily for certified K-12 teachers. Summer. Graduate faculty of the School of Education.

**EDUC 153 CONTENT-AREA READING AND WRITING (3).** Introductory course that focuses on current theory, research, and issues in the teaching and use of reading and writing in the content area. Summer. Spiegel.

**Curriculum and Instruction**

**EDCI 115 PRINCIPLES OF INSTRUCTIONAL DESIGN (3).** Prerequisite, EDUC 72 or a related course. The design and production of instructional materials incorporating goal analysis, task analysis, behavioral objectives, entry behavior, criterion tests, instructional strategies, design planning, and formative evaluation. Fall. Hannum.

**EDCI 120 EARLY CHILDHOOD EDUCATION (3).** Considers the development of early childhood education, growth and development characteristics of young children, and the organization and administration of programs and services for young children. Fall and summer. Brice, Day.

**EDCI 121 THE CURRICULUM OF EARLY CHILDHOOD EDUCATION (3).** Relates the objectives of early childhood education to curriculum in language development, science, social living, numbers, music, art, and dramatic play. Spring and summer. Brice, Day.

**EDCI 180 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 relationships between culture and language. (As demand warrants.) Kubota.

**EDCI 185 ELEMENTARY GENERAL MUSIC METHODS (3).** Provides students with knowledge of structure, scope, and sequence of instruction in elementary general music. (As demand warrants.) Staff.

**EDCI 186 RESEARCH IN MUSIC EDUCATION (3).** Focus on important ideas and concepts concerning research and the potential, limitations, and applications of research methodologies. Fall. Staff.

**EDCI 187 ADVANCED CHORAL METHODS AND VOCAL DEVELOPMENT (3).** Seminar and workshop in pedagogical procedures in choral/vocal art and musical development. (As demand warrants.) Huff.

**EDCI 189 MARCHING BAND PROCEDURES (3).** Provides students with knowledge of the organization, planning, and administration of a marching band program. Students will also acquire the skills of drill writing and show designing. (As demand warrants.) Frielig.

**EDCI 190 MIDDLE GRADES GENERAL MUSIC METHODS (3).** Provides students with knowledge of the structure, scope, and sequence of instruction in middle grades general music. (As demand warrants.) Staff.

**EDCI 199 INDEPENDENT STUDY IN CURRICULUM AND INSTRUCTION (1-3).** May be repeated for a maximum of six credit hours. Readings and research under the direction of a member of the program. Prerequisite, permission of the instructor. Fall and spring. Staff.

**EDCI 200 INTRODUCTION TO CURRICULUM (3).** A survey of 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. Fall, spring, and summer. Brice, Burke, Hennis, Tom.

**EDCI 202 ELEMENTARY EDUCATION IN THE UNITED STATES (3).** A survey of the major features of elementary education, including curriculum determinants in the past and present, organization, structure, and methods of instruction in language arts, social studies, mathematics, science, and the arts. (As demand warrants.) Day, staff.

**EDCI 209 CURRICULUM THEORY (3).** An advanced course that relates curriculum development to relevant theories and research in humanistic and behavioral studies. Spring. Burke, Tom.

**EDCI 210 INSTRUCTIONAL THEORIES (3).** Examines the nature and application of various theories of instruction to instructional goals, individual differences, teaching strategies, sequencing, motivation, and assessment. Prerequisites, a prior course in learning and permission of the instructor. Spring. Hannum.

**EDCI 211 INSTRUCTIONAL SYSTEMS DEVELOPMENT (3).** Delineates strategies for developing instructional systems, including needs assessment, job analysis, goal setting, use of criterion tests, delivery system, project management, and evaluation of learners and programs. Spring. Hannum.

**EDCI 220 ORGANIZATION AND SUPERVISION OF PROGRAMS FOR YOUNG CHILDREN (3).** A course concerned with organizational structures of schools for young children; focuses on students, staff, physical plant, school services, public relations, and curriculum. Required of early childhood majors assuming supervisory roles. (As demand warrants.) Brice, Day.

**EDCI 223 PRINCIPLES AND METHODS IN PARENT EDUCATION AND INVOLVEMENT (3).** Principles, theory, models, and methods for work with parents and families in educational settings, with relevant research and practical applications. Staff.

**EDCI 230 TEACHING WRITING AND THE OTHER LANGUAGE ARTS IN THE ELEMENTARY SCHOOL (3).** A consideration of the objectives, methods, and materials of instruction, issues, trends, and research related to oral language, written expression, listening skills, and reading. Spring. Palmer.

**EDCI 235 THE SOCIAL STUDIES IN THE ELEMENTARY SCHOOL (3).** A study of the objectives, structure, curriculum, research, and experimental programs in the teaching of social studies in the elementary school. (As demand warrants.) Staff.

**EDCI 236 NATURAL SCIENCE IN THE ELEMENTARY SCHOOL (3).** An examination of programs and materials for elementary school science, K-6, with activities to assist teachers in organizing and operating science programs in classrooms. Spring. Jones.

**EDCI 240 INVESTIGATIONS AND TRENDS IN THE TEACHING OF ENGLISH (3).** An advanced course that examines research, current experimental practices, and the effects of language theories upon the purposes, structure, and program of the language arts. Prerequisite, Class A license or equivalent, or permission of the instructor. Summer. Hennis.

**EDCI 245 INVESTIGATIONS AND TRENDS IN THE TEACHING OF SOCIAL STUDIES (3).** An advanced course designed to examine research and the effects of educational theories upon the objectives, structures, and curriculum of the social studies. Prerequisite, Class A license or equivalent, or permission of the instructor. (As demand warrants.) Rong.
EDCI 246 INVESTIGATIONS AND TRENDS IN TEACHING SCIENCE (3). Current trends in the teaching of science, with emphasis on experimental programs in science and research in science education. Prerequisite, a Class A license or equivalent, or permission of the instructor. Spring. Hourshell.

EDCI 247 INVESTIGATIONS AND TRENDS IN TEACHING OF MATHEMATICS (3). Current trends in the teaching of mathematics, with emphasis on research findings and experimental programs. Prerequisite, a license or equivalent, or permission of the instructor. Spring. Ballou.

EDCI 252 GROUP DYNAMICS, DECISION MAKING, AND PROBLEM SOLVING (3). Development of understanding and skills for working with various organizational groups. Focus is on teams, leadership of teams, team problem solving, and team decision making. Fall and spring. Staff.

EDCI 261 HIGHER EDUCATION IN THE UNITED STATES (3). The history and present status of the organization, administration, and curriculum of higher education. Fall. Staff.

EDCI 263 TEACHER EDUCATION IN THE UNITED STATES (3). A study of the research relating to teacher effectiveness and programs for the preparation of teachers. Designed for students planning to work in teacher education. Every other fall. Burke, Tom.

EDCI 265 COLLEGE TEACHING (3). For graduate students in any academic department who plan teaching careers. An introduction to the planning of courses and educational programs for college students. Emphasis is on a systematic approach to developing, implementing, and evaluating instruction. Fall. Staff.

EDCI 283 TRENDS AND ISSUES IN SECOND-LANGUAGE EDUCATION (3). An advanced course designed to address current trends and issues in second-language education and to examine research in the field. Prerequisite, EDUC 83, 84, or EDCI 180 or equivalent. Spring and summer. Heining-Boynton, Kubota.

EDCI 287 INVESTIGATIONS AND TRENDS IN MUSIC EDUCATION (3). Traces the philosophical development of music education from the turn of the twentieth century. Fall. Huff.

EDCI 294 SUPERVISION AND INSTRUCTION (3). An examination of 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.

EDCI 297 RESEARCH IN CURRICULUM AND INSTRUCTION (3). Review and interpretation of existing research in the area of curriculum and instruction, including an exploration of areas of needed research. Prerequisites, EDFO 180, 280, 285, EDCI 200, 209, 210, or permission of the instructor. Spring. Palmer.

EDCI 303 PROBLEMS IN CURRICULUM AND INSTRUCTION (3-6). 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.) Prerequisites, two courses in graduate education. Fall and spring. Staff.

EDCI 306 PRACTICUM IN CURRICULUM AND INSTRUCTION (3-6). Experiences may include projects, field studies, or internships with one of a number of agencies concerned with education. (Sections include early childhood, intermediate, secondary subjects, media, literacy, and general.) Fall and spring. Staff.

EDCI 321 PRACTICUM IN TEACHING EARLY CHILDHOOD EDUCATION (3). Supervised observation and teaching internship experiences in programs for young children. Prerequisites, EDCI 120 and 121. Fall, spring, and summer. Brice, Day.

EDCI 322 PRACTICUM IN SUPERVISION AND ADMINISTRATION OF EARLY CHILDHOOD EDUCATION (3). A supervised internship experience in an administrative or supervisory role in programs for young children. Prerequisites, EDCI 120 and 121; to be taken with or after EDCI 321. (As demand warrants.) Brice, Day.

EDCI 351 GROUP AND ORGANIZATION DEVELOPMENT CONSULTATION (3). The development of advanced skills in group and organization diagnosis and the design of change intervention. Prerequisite, EDCI 252 or permission of the instructor. Fall and spring. Staff.

EDCI 380 EDUCATION WORKSHOPS (3 or 6). Open by special permission to a limited number of qualified graduate students who have specific interests or problems that are adapted to staff and local resources available. (As demand warrants.) Staff.

Educational Foundations

EDFO 101 PSYCHOLOGY OF CHILDHOOD AND ADOLESCENCE (3). 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, Meece.

EDFO 103 THE PSYCHOLOGY OF ADULT LEARNING (3). A focus upon knowledge and application of learning principles and conditions for facilitating learning in adults. Fall or spring. Frierson.

EDFO 120 SOCIAL FOUNDATIONS OF AMERICAN EDUCATION (3). A study of the historical developments, philosophical theories, and social forces influencing American education. Fall, spring, and summer. Stone, Unks.

EDFO 121 SEMINAR IN SOCIAL FOUNDATIONS OF EDUCATION (1). Topics in the social and philosophical context of American public education. Fall. Staff.

EDFO 122 SEMINAR IN SOCIAL FOUNDATIONS OF EDUCATION (1). Topics in the social and philosophical context of American public education. Spring. Staff.

EDFO 180 STATISTICAL ANALYSIS OF EDUCATIONAL DATA I (4). Descriptive and inferential statistics for educational research, including an introduction to fundamentals of research design and computer data analysis. Fall and summer. Ware.

EDFO 199 INDEPENDENT STUDY IN HUMAN DEVELOPMENT AND PSYCHOLOGICAL SERVICES (1-3). Reading and research under the direction of a member of the program whose interests coincide with those of the student. May be repeated for a maximum of six credit hours. Prerequisite, permission of the instructor. Fall and spring. Staff.

EDFO 201 PSYCHOLOGY OF LEARNING IN THE SCHOOL (3). A study of learning in the school setting, with emphasis on fundamental concepts, issues, evaluation of materials and experiences. Prerequisite, EDUC 72 or equivalent. Fall and spring. Struck.

EDFO 202 THEORIES AND RESEARCH IN HUMAN DEVELOPMENT (3). An advanced-level course in human development covering the basic theories and the research bases for instructional decisions. Prerequisite, permission of the instructor. Spring. Coop, Meece.

EDFO 206 APPLIED MEASUREMENT THEORY FOR EDUCATION (3). 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. Prerequisite, EDFO 180. Spring. White.

EDFO 220 PHILOSOPHY OF MODERN EDUCATION (3). A comparative study of current philosophies of education with particular attention to their impact on solutions offered to problems currently recognized in American education. Fall of odd-numbered years. Stone.
EDFO 222 ETHICAL ISSUES IN 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.

EDFO 223 EDUCATIONAL SOCIOLOGY (3). An application of sociological theory and research to problems of concern to educators. Fall. Noblit.

EDFO 224 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.

EDFO 228 THE SCHOOL IN AN URBAN SETTING (3). Designed as a seminar to explore the implications of urbanization for educational agencies. Particular attention is given to public schools. (As demand warrants.) Noblit.

EDFO 241 EUROPEAN FOUNDATIONS OF MODERN EDUCATION (3). A survey of the social forces influencing the development of western education in Europe from ancient times until the beginning of the twentieth century. Fall of even-numbered years. Staff.

EDFO 242 SOCIAL AND EDUCATIONAL HISTORY OF THE UNITED STATES (3). 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.

EDFO 245 COMPARATIVE EDUCATION (3). A study of education in other cultural settings, with implications for the student of American education. (As demand warrants.) Staff.

EDFO 288 PROGRAM EVALUATION IN EDUCATION (3). An examination of major approaches to program evaluation with emphasis on differences between evaluation and research. Prerequisites, EDFO 180 and 390-1. Fall and spring. Frierson.

EDFO 297 FIELD TECHNIQUES IN EDUCATIONAL RESEARCH (3). An introduction to field research methods and analysis of qualitative data that focuses on the application of these techniques in evaluation and policy research. Prerequisites, EDFO 180 and 285. Fall and spring. Marshall, Noblit, Staff.

EDFO 301 SEMINAR IN HUMAN DEVELOPMENT AND INDIVIDUAL DIFFERENCES (3). Analyzes research data and theoretical positions pertaining to individual differences in human development in the educational setting. Prerequisite, at least one course in human development at the graduate level, or permission of the instructor. Spring of even-numbered years. Coop, Merce.

EDFO 302 SEMINAR IN HUMAN LEARNING AND COGNITION (3). Studies theoretical aspects and practical implications of psychologies of learning. Prerequisite, one or two courses in educational and developmental psychology. Fall or spring of odd-numbered years. Stuck.

EDFO 303 PROBLEMS IN EDUCATIONAL MEASUREMENT (3). 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. Prerequisites, EDFO 180 and 206, permission of the instructor. Fall, spring, and summer. Staff.

EDFO 305 PROBLEMS IN EDUCATIONAL PSYCHOLOGY (3-6). Study and development of original investigations in the area of educational psychology. Prerequisite, permission of the instructor. Fall, spring, and summer. Staff.

EDFO 321 SEMINAR IN EDUCATIONAL PHILOSOPHY (3-6). May be repeated for credit. Topics in educational philosophy to be determined by the students with the instructor. (As demand warrants.) Stone.

EDFO 323 PROBLEMS IN THE PHILOSOPHICAL FOUNDATIONS OF EDUCATION (3 or more). Provides an opportunity for advanced doctoral students to do independent study under supervision. Prerequisite, EDFO 220 or equivalent. (As demand warrants.) Staff.

EDFO 324 PROBLEMS IN THE SOCIOLOGICAL FOUNDATIONS OF EDUCATION (3 or more). Provides an opportunity for advanced doctoral students to do independent study under supervision. Prerequisites, EDFO 223 or equivalent. Fall and spring. Noblit.

EDFO 325 PROBLEMS IN THE ANTHROPOLOGICAL FOUNDATIONS OF EDUCATION (3 or more). Provides an opportunity for advanced doctoral students to do independent study under supervision. Prerequisite, permission of the instructor. (As demand warrants.) Noblit.

EDFO 341 PROBLEMS IN THE HISTORY OF EDUCATION (3 or more). Provides an opportunity for advanced doctoral students to do independent study under supervision. Prerequisites, EDFO 241 and 242, or equivalents. (As demand warrants.) Unks.

EDFO 342 PROBLEMS IN COMPARATIVE EDUCATION (3 or more). Provides an opportunity for advanced doctoral students to do independent study under supervision. Prerequisites, EDFO 245 or equivalent. (As demand warrants.) Staff.

EDFO 380 STATISTICAL ANALYSIS OF EDUCATIONAL DATA III (3). An extension of the general linear model to analysis of educational data with multiple dependent variables, with computer applications. Prerequisites, EDFO 180, 280, and 285. Fall and summer. Ware.

EDFO 385 DOCTORAL RESEARCH SEMINAR (3). Provides an opportunity for group development and evaluation of research in a particular area of concern. Prerequisites, two courses in graduate education and permission of the instructor. Fall and spring. Members of the graduate faculty.

EDFO 390 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.) Members of the graduate faculty.

EDFO 393 MASTER'S THESIS (3 or more). Fall, spring, and summer. Members of the graduate faculty.

EDFO 394 DOCTORAL DISSERTATION (3 or more). Fall, spring, and summer. Members of the graduate faculty.

EDFO 400 GENERAL REGISTRATION (0).

**Specialized Professional Education**

EDSP 120 INTRODUCTION TO SCHOOL PSYCHOLOGY (3). Introduces the student to concepts and methods involved in school psychology. (As demand warrants.) Staff.

EDSP 130 INTRODUCTION TO EXCEPTIONAL CHILDREN (3). A comprehensive survey of giftedness and of various disabling conditions: mental retardation, emotional disturbance, learning disabilities, speech impairment, deafness, blindness, orthopedic impairment, and neurological impairment. Fall, spring, and summer. Stedman, staff.

EDSP 132 THE GIFTED CHILD IN SCHOOL AND SOCIETY (3). The nature of giftedness and creativity; characteristics of gifted and creative children; approaches to encouraging the development and utilization of their abilities. Spring. Gallagher.

EDSP 143 INTRODUCTION TO COMMUNICATION DISORDER (SPHS 183) (3). Explores the etiology, epidemiology, assessment, and educational implications of speech and language disorders. Fall, spring, and summer. Lubker.
EDSP 179 MANAGEMENT OF LEARNING ENVIRONMENTS (3). Emphasis on effective behavior management and applied behavior analysis techniques for intervening in the environments of exceptional children to increase learning. (As demand warrants.) Staff.

EDSP 199 INDEPENDENT STUDY IN EDUCATIONAL LEADERSHIP (1-3). Readings and research under the direction of a program faculty member. May be repeated for a maximum of six credit hours. Prerequisite, permission of the instructor. Fall, spring, and summer. Staff.

EDSP 200 INTRODUCTION TO SCHOOL COUNSELING (3). Philosophical bases of pupil personnel services, with emphasis on elementary and secondary school guidance programs. Prerequisite, graduate standing. Summer. D. Brown.

EDSP 201 THEORIES OF COUNSELING (3). Current theories of counseling, with emphasis on theory as a means of conceptualizing behavior change in the counseling process. Prerequisite, permission of the instructor. Summer. Galassi.

EDSP 202 CAREER DEVELOPMENT AND COUNSELING (3). Major theories of career development are examined. The use and appraisal of student information in career counseling are major topics. Fall. D. Brown.

EDSP 203 PRE-PRACTICUM IN COUNSELING (3). Interviewing techniques developed at specified levels of competence through role playing and video and audio feedback. Prerequisites, EDSP 201 (may be taken concurrently), permission of the instructor. Summer. Staff.

EDSP 204 TESTS AND MEASUREMENTS (3). Basic concepts in measurement and their application in the use and interpretation of tests. The student may be required to purchase tests. Prerequisite, EDSP 200. Fall. Brooks.

EDSP 205 GROUP COUNSELING PROCEDURES (3). Application of counseling theory and research to the organization and implementation of group counseling. Prerequisite, permission of the instructor. Fall. Staff.

EDSP 206 PRACTICUM IN SCHOOL COUNSELING (3-9). Development of individual counseling skills and an understanding of the school as a setting for counseling through an apprenticeship experience. Prerequisites, EDSP 201 and 203, permission of the instructor. Fall. Brooks, Galassi.

EDSP 207 INTERNSHIP IN SCHOOL COUNSELING AND CONSULTATION (3-9). 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. Prerequisites, EDSP 201 and 203, permission of the instructor. Spring. Brooks, D. Brown, Galassi.

EDSP 209 ISSUES IN ORGANIZING GUIDANCE SERVICES (3). Emphasis on organizing guidance services to meet such problems as those related to the special needs of women, minority groups, and the drug problem. Prerequisite, eighteen hours in counseling courses. Summer. D. Brown.

EDSP 210 CROSS-CULTURAL COUNSELING (3-6). An exploration of the cognitive and affective considerations of counseling in culturally different social systems. This includes ways to incorporate specific sociocultural dimensions into the counseling process. Prerequisite, permission of the instructor. Spring. Brooks.

EDSP 221 PSYCHO-EDUCATIONAL ASSESSMENT (1-3). A sequence of courses addressing knowledge and skills in techniques of observation, interviewing, assessment of environment, intelligence, achievement, perceptual motor skills, and interpersonal perceptions. May be repeated for credit. Prerequisite, permission of the instructor. Fall and spring. Brantley, Simeonsson.
EDSP 239 TEACHING OF READING AND WRITING (4). Survey of developmental reading and writing instruction, K-12. Major theories and practices in reading and writing are explored, emphasizing integration of these two areas with each other and across the curriculum. Fall. Cunningham, Fitzgerald, Spiegel.

EDSP 240 ASSESSMENT AND REMEDIATION OF READING AND WRITING DIFFICULTIES (4). 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. Prerequisite, EDSP 239 (may be taken concurrently). Fall. Cunningham, Fitzgerald, Spiegel.

EDSP 242 EXCEPTIONAL CHILD DEVELOPMENT (3). Emphasis on developmental deviation exhibited by exceptional children in cognitive, language, social, and affective development. Spring, Simeonsson.

EDSP 247 EDUCATIONAL EVALUATION OF HANDICAPPED CHILDREN (3). Study and practice in the use of both formal and informal diagnostic assessment and observational techniques appropriate for the teacher of children with learning problems. Fall or spring. Maskel, Swartz.

EDSP 248 CURRICULUM DEVELOPMENT IN SPECIAL EDUCATION (3). Designed to help 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.

EDSP 250 PROGRAM PLANNING, POLICY ANALYSIS, AND EVALUATION OF SPECIAL POPULATIONS (3). An introduction to program planning, policy analysis, and program evaluation as related to special education issues. Prerequisite, permission of the instructor. Fall. Gallagher.

EDSP 266 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.

EDSP 267 FEMINIST ANALYSES OF POWER AND ETHICS (3). Seminar covers feminist critiques of organizational and political power structures in readings and discussions leading to group and individual research projects. (As demand warrants.) Marshall.

EDSP 268 SCHOOL GOVERNANCE (3). Focus is 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. Prerequisite, permission of the instructor. Fall. Staff.

EDSP 283 PROGRAM DEVELOPMENT FOR SPECIAL POPULATIONS (3). Review of issues associated with program development for children who are experiencing uneven success in school because of poverty attendance, poverty, drug and alcohol abuse, disabling conditions, parental abuse, or violent behaviors. Prerequisite, permission of the instructor. Fall and spring. W. Malloy.

EDSP 284 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. Morrison.

EDSP 286 SCHOOL REFORM AND CHANGE (3). Introduction to effective strategies and tactics for changing schools, varieties of school restructuring, importance of multicultural education and client-friendly school environments in site-based organizations. Prerequisites, EDSP 290A and 290B, permission of the instructor. Fall and spring. Hunter.

EDSP 287 THE SOCIAL CONTEXT OF EDUCATIONAL LEADERSHIP (4). 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. Morrison.

EDSP 288 EDUCATIONAL POLICY PROCESSES AND ANALYSIS (3). Theoretical examination 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 and spring. Marshall.

EDSP 290A THE EXCELLENT SCHOOL SEMINAR (3). Research and models on high performing organizations, instructional effectiveness, and national school reform efforts presented in the context of traditional and emerging organizational theory and research. Prerequisite, permission of the instructor. Fall. Staff.

EDSP 290B THE EXCELLENT SCHOOL SEMINAR (3). Research and models on high performing organizations, instructional effectiveness, and national school reform efforts presented in the context of traditional and emerging organizational theory and research. Prerequisite, permission of the instructor. Spring. Staff.

EDSP 291 ORGANIZATION THEORY (3). A critical analysis of the theoretical assertions and empirical knowledge claims that have led to the dominant structures, power relationships, and performance expectations of American schools. Prerequisite, permission of the instructor. Fall. Staff.

EDSP 292 SCHOOL-BASED INQUIRY (3). An examination of the quantitative and qualitative research methodologies appropriate to school settings; evaluation of research and its application to schools. Fall and spring. Morrison.

EDSP 293 MANAGEMENT IN EDUCATIONAL ORGANIZATIONS (3). An examination of the processes of management and their relationship to the success of the instructional programs in schools and school systems. Prerequisites, EDSP 291, permission of the instructor. Fall. Staff.

EDSP 294 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. Hunter.

EDSP 295A INTERNSHIP SEMINAR ON INSTRUCTIONAL LEADERSHIP AND SUPERVISION (3). Relates internship experiences and applications about instructional design techniques of teaching/learning, evaluation of teaching/learning processes, and ways in which school-based leaders can support excellence in education. Fall. Staff.

EDSP 295B INTERNSHIP SEMINAR ON SCHOOL BUILDING MANAGEMENT (3). Relates internship experiences and applications of school business management practices, such as transportation, food services, plant planning, etc., to schools. Spring. Mabe.

EDSP 296 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. Hunter.

EDSP 297 INTEGRATIVE SEMINAR ON MANAGEMENT APPLICATIONS, DILEMMAS, AND CONFLICTS (3). Requires students to integrate previous studies to focus on management applications, dilemmas, and conflicts. Prerequisites, EDSP 287, 288, 291, and 293. Spring. W. Malloy.

EDSP 298 SCHOOL LAW (1-3). Provides an overview of the legal structure of education, liability, constitutional rights, contractual relationships, federal regulations, and collective action. May be repeated for credit. Prerequisites, course required for the Class A North Carolina Teachers License and six semester hours of graduate work in school administration. Fall, spring, F. Brown.

EDSP 299 INTEGRATIVE SEMINAR ON THEORY, INQUIRY, AND ORGANIZATIONAL PRACTICE (3). Requires students to integrate previous studies to focus on theory, inquiry, and organizational practice. Prerequisites, EDSP 287, 288, 291, and 293. Fall, spring. Staff.
EDSP 300 PSYCHOLOGY OF CAREER DEVELOPMENT (3). Open to doctoral students. Review of theories and research in psychology of career development and counseling. Emphasis is on theory and implications for practice. Fall. D. Brown.

EDSP 303L ADVANCED COUNSELING STRATEGIES LABORATORY (1). Includes but is not limited to techniques in assessment, behavioral counseling, career counseling, cross-cultural counseling, and group counseling. May be repeated for credit. Prerequisites: EDSP 201 and 203, permission of the instructor. Fall and spring. D. Brown, Galassi.

EDSP 304 COUNSELING PSYCHOLOGY: THEORIES AND PRACTICE (3). An examination of selected theories of counseling, combining readings and analysis of counseling experiences. Prerequisites, EDSP 201 or equivalent, permission of the instructor. Spring. Brooks, D. Brown.

EDSP 320 DOCTORAL INTERNSHIP IN SCHOOL PSYCHOLOGY (1-6). Supervised field placement experiences for doctoral-level students in school psychology, integrating training with field responsibilities at a systems level in schools and school-related settings. Prerequisite, permission of the instructor. Fall and spring. Staff.

EDSP 322 SEMINAR IN LEARNING DISABILITIES (3). Explores the etiology, classroom manifestations, and treatment programs of children with learning disabilities. Prerequisite, permission of the instructor. (As demand warrants.) Lillie.

EDSP 325 PROBLEMS IN SCHOOL PSYCHOLOGY (1-3). Provides an opportunity for advanced students to do independent study under supervision. May be repeated for credit. Prerequisite, permission of the instructor. Fall and spring. Staff.

EDSP 330 INVESTIGATIONS IN READING AND WRITING (3). Reviews recent studies in the teaching of reading and writing and draws inferences for instruction. Prerequisite, permission of the instructor. Spring. Cunningham, Fitzgerald, Spiegel.

EDSP 340 MASTER'S INTERNSHIP (3 or 6). 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. Cunningham, Fitzgerald, Lillie, Spiegel.

EDSP 341 SUPERVISED POST-MASTER'S INTERNSHIP IN SPECIAL EDUCATION (3, 6, or 9). A full-time field placement under the joint direction of a University staff member and a selected professional at the internship site. Prerequisite, permission of the instructor. Fall and spring. Staff.

EDSP 342 SEMINAR IN SPECIAL EDUCATION (1-3). Advanced seminar on special education issues and topics involving the interpretation and application of theory and research. May be repeated for credit. Fall, summer. Boone, Lillie.

EDSP 345 PROBLEMS IN SPECIAL EDUCATION (3). Available for post-master's students who wish to engage in supervised field and pilot research. May be repeated for credit. Prerequisite, permission of the instructor. Fall, spring, and summer. Lillie, staff.

EDSP 388 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. Staff.

EDSP 390 SEMINAR AND SUPERVISED INTERNSHIP IN EDUCATIONAL ADMINISTRATION (1-6). A supervised internship in school administration to facilitate the student's progress toward certification in the principalship. May be repeated for credit. Prerequisite, six semester hours in educational administration, including EDSP 291, and permission of the instructor. Fall, spring, and summer. Staff.

EDSP 391 ADVANCED SEMINAR AND SUPERVISED INTERNESHIP IN EDUCATIONAL ADMINISTRATION (1-6). 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. Prerequisites, EDSP 291, 295, and 296, permission of the instructor. Fall, spring, and summer. Staff.

EDSP 395 PROBLEMS IN EDUCATIONAL ADMINISTRATION (3 or 4). Provides an opportunity for advanced students to do independent study under supervision. May be repeated for credit. Prerequisite, permission of the instructor. Fall, spring, and summer. Staff.

EDSP 396 PROBLEMS IN SUPERVISION (3 or 4). A study of major problems in the supervision of instruction, investigations of new trends, and recent research. Prerequisite, permission of the instructor. (As demand warrants.) Staff.

DEPARTMENT OF ENGLISH

WILLIAM L. ANDREWS, Interim Chair

Professors
William L. Andrews (101) African American
Christopher M. Armitage (1) Twentieth Century, Renaissance
Laurence G. Avery (2) Twentieth Century
Doris W. Berta (59) Creative Writing
Alan C. Dessen (6) Renaissance
Connie C. Eble (9) English Language, Linguistics
Joseph M. Flora (13) American, Twentieth Century
Darryl J. Gless (62) Renaissance
Johnny Lee Greene (57) American, African American
Philip Guns (78) American, American Studies
William R. Harmon (17) Twentieth Century, Poetry, Creative Writing
Thudier Harris (60) Twentieth Century, African American
Mae Henderson (102) African American
Fred Holson (84) American, Southern
Joy Kasson (90) American, American Studies
Edward D. Kennedy (22) Medieval
J. Kimball King (23) Twentieth Century, American, Southern
George T. Lansing Jr. (26) Twentieth Century
Erika C. D. Lindemann (53) Composition
Charles T. Ludington Jr. (27) Twentieth Century, American Studies
John P. McGowan (92) Critical Theory
Jeanne Moskal (77) Nineteenth-Century British, Critical Theory
Patrick P. O'Neill (66) Medieval
Daniel W. Patterson (36) American, Folklore
Julius R. Raper III (38) Twentieth Century, Southern
Richard D. Rust (42) American, American Studies
James Seay (87) Creative Writing
Alan R. Shapiro (96) Twentieth Century, Creative Writing
Beverly W. Taylor (70) Victorian Literature
James P. Thompson (72) Eighteenth-Century British
Weldon E. Thornton (48) Twentieth Century
Joseph S. Viscomi (76) Nineteenth-Century British
Linda Wagner-Martin (80) American, Twentieth Century
David Whisnant (81) Folklore, American Studies
Joseph S. Wittig (51) Medieval
Charles G. Zug III (52) Folklore, Twentieth Century

Associate Professors
A. Reid Barbour (83) Renaissance
Thomas Cohen (85) Twentieth Century, Criticism and Theory
James W. Coleman (89) American, African American
Pamela Cooper (88) Twentieth Century
Anne D. Hall (54) Renaissance
Ritchie D. Kendall (64) Renaissance
Robert G. Kirkpatrick (24) English Romanticism
Laure Langhauser (97) Nineteenth Century, Victorian Literature, Criticism and Theory
Theodore H. Leinbaugh (65) Medieval
Allan R. Life (55) Victorian Literature
Susan Navarette (86) Nineteenth-Century British Fiction
Margaret A. O'Connor (35) American, Women's Studies, American Studies
Thomas A. Stumpf (45) Eighteenth-Century British

Assistant Professors
Daniel R. Anderson (104) Composition
Jane M. Danielewicz (98) English Language, Composition
Robert Johnstone (93) American
Megan Matchinskie (94) Renaissance
Michael A. McFee (99) Creative Writing
Thomas Reinert (103) Eighteenth Century
Todd W. Taylor (105) Composition

Professors Emeriti
Charles E. Edge
Everett Emerson
Howard M. Harper Jr.
S. K. Heninger Jr.
C. Carroll Hollis
Blyden Jackson
George J. Kane
Fred H. MacIntosh
William A. McQueen
Jerry L. Mills
Peter G. Phialas
Mark L. Reed
Louis D. Rubin Jr.
H. Maxwell Steele
Albrecht B. Strauss
William S. Wells

The 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 and a minor in one of seven literary periods, critical theory and cultural studies, rhetoric and composition, African American literature, or Southern literature. The English language may also serve as a minor. Students may take an appropriate minor outside the department, with the approval of the director of graduate studies; formal minors in Medieval Studies, Renaissance Studies, and American Studies are also available (see the end of the Classics entry). The department recognizes the following areas of specialization:

**The English language**
- 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 literacy
African American literature
Southern literature

**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 serve as applications for fellowships and assistantships if the applicant marks the appropriate statement on the form.

Applications 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. Every applicant without an M.A. in English is considered an applicant for the M.A. degree. 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 web page: [www.unc.edu/depts/english](http://www.unc.edu/depts/english)

**Fellowships and Assistantships**

Financial support for graduate students is described in the General Information section under the heading “Fellowships and Financial Aid.” 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 $4,100 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, write a thesis (English 393), and pass a written comprehensive examination. The courses elected by an M.A. student must include Bibliography and Methodology (English 298); either Old English
(English 237a or English 237b) or Modern Grammar (English 136); Rhetorical Theory and Practice (English 131); and six courses from at least four of the literary fields just enumerated. 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 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: Bibliography (English 298 or the equivalent); Old English (English 237a or English 237b) and a second language course (English 136 or English 238 or English 250) or a graduate course in linguistics; 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: a written examination in the major and minor, and an oral examination in the major and minor and on the dissertation subject area. Doctoral candidates must also demonstrate a reading knowledge of two foreign languages. The program culminates with the candidate writing a dissertation (at least 3 semester hours of English 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 or five 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. At the M.A. level, the foreign language requirement must be satisfied before the student can be admitted to candidacy.

Library and Research Facilities

The library system at The University of North Carolina at Chapel Hill was recently 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, UNC-Chapel Hill graduate students may use the Duke University libraries.

Publications

Early American Literature, Studies in Philology, Eighteenth Century Studies, The Southern Literary Journal, Victorians Institute Journal, and a.l.h. Auto/Biography 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 non-native 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 world 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.

134S CREATIVE WRITING FOR TEACHERS (3). For students who undertake creative writing or a study of literary forms. Recommended for teachers of creative writing.

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 (CMPL 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 multidisciplinary 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 (Märchen, 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, 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.


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. Spring.

Courses for Graduates

237A OLD ENGLISH GRAMMAR AND READINGS (3). Introduction to the early history of the English language through a study of the phonology, inflections, and syntax of Old English prose and 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 sounds and vocabulary of English 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 non textual materials.

244 STUDIES IN THE ENGLISH NOVEL OF THE NINETEENTH CENTURY (3). Examination of the major nineteenth-century novelists, such as Austen, Scott, Dickens, Thackeray, Eliot, the Brontës, Trollope, Hardy, Meredith, with particular attention to problems of technique.

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 later 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 three 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.

294 STUDIES IN ANGLO-IRISH LITERATURE (3). Typical topics: Some aspects of the literary renaissance, e.g., Yeats and Joyce in their literary milieu or nineteenth-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 such 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. Required of all graduate students in English.

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).

341 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 nondramatic 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).
391 SEMINAR IN LITERARY AND CULTURAL THEORY (3). Topics vary: e.g., feminist theory, cultural materialism, new historicism, interdisciplinary examinations of the aesthetic.
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 (Strachan) and from Aslinge Oengus (Shaw).
105B OLD AND MIDDLE WELSH (3). An introduction to Medieval Welsh language and literature, with selected readings from the Mabinogion and the early native 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 Táin (Strachan), Cath Gablach (Binchy), Cambrai Homily, early Irish lyric (Murphy), Scéala Mucce Mic Dathó (Thurneysen).
106B READINGS IN OLD AND MIDDLE WELSH (3).
Prerequisite, Celtic 105B. Selected readings from medieval Welsh poetry (Cynfeiriad, Gogynfeiriad, and cywydd poets), sagas (Branwen), 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 Scolá Fhein, Peig, Fiche Bliain ag Fás and poetry (the aisling 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.

CURRICULUM IN FOLKLORE

CHARLES GORDON ZUG, Chair

Professors
Carole L. Cramley (22) Archaeology, Complex Societies, Europe
Leon Fink (4) American Labor History
Kaja Finkler (21) Medical Anthropology, Latin America
Jacquelynn Hall (18) American History, Southern Oral History
*Trudier 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 Melchert (23) Indo-European Linguistics
Patrick F. O'Neill (20) Medieval Literature, Celtic Languages and Culture
*Daniel W. Patterson (9) Folk song, Southern Folklore, Folk Religion
James Lowe Peacock (10) Culture Change, Symbolic Systems, Southeast Asia
Jack M. Sason (17) Ancient Near East
Ruel W. Tyson Jr. (15) Philosophy and Anthropology of Religion
*David E. Whisman (24) Country Music, Documentary Film, Appalachian Culture, Politics of Culture
*Charles Gordon Zug (14) Folk Narrative, Material Folk Culture, Folk Art

Associate Professors
Robert Edward Daniels (2) Social Anthropology, Culture and Personality, Africa
John W. Florin (16) Population Geography, Medical Geography, and Historical Anglo-America

* core faculty members
The curriculum offers both a major and a minor for the Master of Arts degree and a doctoral minor for those with a major in a related department. Some folklore courses originate with the curriculum. Other pertinent graduate courses offered in such departments as Anthropology, English, Geography, History, Linguistics, Music, and Religious Studies are cross-listed. Students from any undergraduate major are eligible to take work in the Curriculum in Folklore.

The aim of the curriculum is to give students a solid introduction to the discipline of folklore and to prepare them for either advanced academic study of folklore or for employment in such fields as public-sector folklore. It offers both classroom instruction and practical training in the tools and techniques of field and library research and other professional activities.

University resources that support the program include tape recorders and cameras for field work and extensive library holdings of books, manuscripts, periodicals, photographs, slides, and sound recordings relating to folklore. Resources are especially strong in materials about the folklore of the United States—particularly the South—and of the British Isles and West Africa. Among the distinguished collections are the Archie Green Occupational Folklore 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 Folklore Collection of field and commercial recordings.

Recent projects of the curriculum have included the preparation of documentary films, sound recordings, radio programs, and museum exhibitions. Research interests of the faculty members indicate other lines along which students may pursue their research training most advantageously: the ballad, folk music, and folk tale; folklore of the South; African American folklore; folk religion; the spiritual, oral history, material folk culture, public folklore, and the politics of culture.

For more complete course descriptions, see the departmental course listings.

**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 NATIVE NORTH AMERICAN CULTURES (ANTH 130) (3). Spring. Staff.
132 LATIN AMERICAN CULTURES (ANTH 132) (3). Fall. Finkler.
133 THE PEOPLE OF THE CARIBBEAN (ANTH 133) (3). Fall. Staff.
134 ANTHROPOLOGY OF ART AND ARCHITECTURE (ANTH 134) (3). Spring. Johnson.
135 CONSCIOUSNESS AND SYMBOLS (ANTH 135) (3). Fall. Peacock.
143 INDO-EUROPEAN CULTURE AND SOCIETY (LING 142) (3). Fall. Melchert.
146 INTRODUCTION TO FOLKLORE (ENGL 146) (Comparative Literature 146) (ANTH 146) (3). Fall. Zug.
147 BRITISH AND AMERICAN FOLKSONG (ENGL 147) (3). Fall. Patterson.
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. Zug.
153 MEDIEVAL ROMANCE (ENGL 153) (3). Fall. Kennedy.
154 HISTORICAL GEOGRAPHY OF THE UNITED STATES (GEOG 154) (3). Florin.
155 METHOD AND THEORY IN ETHNOHISTORY RESEARCH (ANTH 155) (3). Fall. Crumley.
171 MEDICINE AND ANTHROPOLOGY (ANTH 170) (3). Fall. Finkler.
174 THE THEORY AND PRACTICE OF ORAL HISTORY: A FIELD WORK APPROACH (HIST 170) (3). Fall. Hall.
175 ETHNOGRAPHIC METHOD (ANTH 175) (3). Spring. Staff.
185 WOMEN IN FOLKLORE AND LITERATURE (ENGL 185) (3). Spring. Staff.
186 FOLK NARRATIVE (ENGL 186) (3). Spring. Zug.
188 COUNTRY MUSIC AND AMERICAN SOCIETY (3). A historical and cultural analysis of country music, exploring its relationship to traditional and popular music, its repertory and performers, its institutions, its reflection of social issues, values, and change. Spring. Whisnant.
189 AFRO-AMERICAN FOLKLORE (ENGL 189) (3). Fall. Staff.
190 VERNACULAR 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. Fall. Hinson.
192 TRADITIONAL CULTURE IN FILM (3). A critical survey of selected documentary films exploring traditional culture itself, issues inherent in the comprehension and interpretation of culture, and the politics of culture in a multicultural society. Fall. (Alternate years.) Whisman.

193 THE POLITICS OF CULTURE (3). A comparative, historical, and multidisciplinary analysis of the politics of culture. Special attention to cultural regionalism and nationalism; legitimization, marginalization, survival, and revitalization; documentation, preservation, and presentation; policies, institutions, and programs. Whisman.

194 EXPRESSIVE CULTURE OF THE APPALACHIAN REGION (ENGL 194) (3). Intensive analysis of the expressive culture of the Appalachian region (material culture, music, film, literature, oral narratives, architecture) with special attention to social, economic, and historical context. Fall. Whisman.

198 FIELD RESEARCH (3). Fall and spring. Staff.

199 DIRECTED READINGS IN FOLKLORE (3). Fall and spring. Staff.

Courses for Graduates
266 OCCUPATIONAL HISTORY AND FOLKLORE (HIST 266) (3). 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. Hinson.

295 STUDIES IN FOLKLORE (3). Fall and spring. Staff.

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.

400 GENERAL REGISTRATION (0).

CURRICULUM IN GENETICS AND MOLECULAR BIOLOGY

SUSAN T. LORD, Director

Professors
Steven L. Bachenheimer (30) Molecular Virology; Regulation of Herpes Simplex Virus Gene Expression
Kerry S. Bloom (45) Mechanisms of Chromosome Segregation in Yeast; Chromosome and Spindle Dynamics
David A. Brenner (100) Regulation of Gene Transcription; Hepatic Fibrogenesis; Porphyrias
Janne G. Cannon (46) Molecular Biology of Bacterial Pathogens
Stephen G. Chuang (105) DNA Repair; Drug Resistance; Cancer Chemotherapy; Damage-Inducible Checkpoints
Channing J. Der (88) Oncogenes; 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
Rosann A. Farber (71) Human Molecular Genetics; Somatic-Cell Genetics; Cancer Genetics
Jeffrey A. Frelinger (49) Molecular Immunogenetics, Function of Major Histocompatibility Complex in Virus Infection
Jack Griffith (35) HIV; Transcription; Electron Microscopy
Eng Shang Huang (52) Pathobiology and Genetics of Human CMV
Clyde A. Hutchison III (10) Molecular Genetics, DNA Sequence Analysis; Site-Directed Mutagenesis
Rysaid Kole (64) RNA Processing, RNA-Protein Interactions; Antisense Oligonucleotides as Chemotherapeutic Agents
Steven A. Leadon (89) Molecular Genetics and Biochemistry of DNA Repair; Oxygen Radicals; Breast Cancer
Susan T. Lord (53) Role of Fibrinogen in Vascular Disease; Fibrinogen Structure-Function Analysis
Nobuyo Maeda (72) Evolution of Multigene Families; Apolipoprotein Genes and Atherosclerosis
William F. Marlluff (85) Regulation of RNA Metabolism in Animal Cells
Steven W. Matson (54) Biochemistry and Genetics of DNA Helicases from E. coli and Yeast
Ann G. Marthysse (24) Molecular Genetics of Bacterial Plant Pathogens
Beverly S. Mitchell (97) Gene Expression; Purine Pyrimidine Metabolism; Leukemogenesis
John E. Newbold (20) Molecular Biology of Hepatitis Viruses; Hepatitis B Virus and Antiviral Drugs
Joseph S. Pagano (96) Infectious Diseases and Cancer; Regulation of Latency and Replication Genes of Epstein-Barr Virus; Mechanisms of Antiviral Agents
Thomas D. Petes (69) Analysis of Recombination and Chromosome Structure in Yeast
John R. Pringle (86) Yeast Genetics and Cell Biology; Cytoskeletal Function; Cellular Morphogenesis
Ralph S. Quarano (87) Plant Development; Regulation of Gene Expression and Cellular Polarity
Howard M. Reisner (25) Immunogenetics of Human Serum Proteins
Aziz Sancar (58) Structure and Function of DNA Repair Enzymes
Lawrence M. Silverman (99) Molecular Techniques in Clinical Definition and Diagnosis of Human Genetic Disorders
Oliver Smithies (70) Targeted Modification of Genes for Use in Genetic Therapy
P. Frederick Sparling (21) Molecular Genetics; Neisseria gonorrhoeae; N. meningitidis
Ronald I. Swanstrom (51) Retroviruses; Molecular Biology of AIDS Virus
Jenny Pan-Yun Ting (104) Molecular Immunology; Molecular Regulation of Eukaryotic Genes
Michael D. Topal (42) Protein-DNA Interactions; Protein Engineering
Terry A. Van Dyke (101) Regulation of Cell Growth Control
Bernard E. Weissman (77) Tumor Suppressor Genes; Cancer Genetics

Associate Professors
Albert S. Baldwin (79) Regulation of Gene Expression, Structure and Regulation of DNA Binding Proteins
Victoria L. Bautch (73) Molecular Genetics of Angiogenesis and Tumorigenesis in Transgenic Mice
Stephen H. Clarke (82) Molecular Immunology; B-Cell Differentiation and Tolerance; Autoimmunity
Stephen T. Crews (61) Molecular Genetics of Nervous System Development in Drosophila
Jeffery L. Dangl (106) Plant Genetics and Cellular Biology, Plant Disease Resistance and Cell-Death Control
Cora-Jean S. Edgell (47) Somatic Cell Genetics and Molecular Genetics of Differentiated Gene Expression in Human Endothelial Cells
Howard M. Fried (50) Transport of RNA and Nuclear Proteins; Molecular/Cell Biology
Edison T. Liu (68) Molecular Genetics of Tumor Progression, Oncogene Action
Gustavo P. Maroni (23) Molecular Genetics; Gene Expression in Drosophila
Brian J. Popko (84) Molecular Neurobiology, Nerve Regeneration and Myelination
Patricia J. Pukkila (34) Molecular Mechanisms of Genetic Recombination and Meiosis in Coprinus sp.
Kathleen W. Rao (60) Human Cytogenetics; Somatic-Cell Genetics
R. Jude Samulski (103) Development of Virus-Based Delivery Systems for Use in Human Gene Therapy
Gwendolyn B. Sancar (75) Regulation of Damage-Inducible Genes in Eukaryotes; Damage Recognition by DNA Repair Enzymes from Eukaryotes
Lilie L. Searles (66) RNA Processing Control in Drosophila; Developmental Genetics
Jean-Michel H. Vos (76) Repair and Replication of Human Chromosomes; Episomal-Based and Herpesviral-Based Gene Therapy
Ellen R. Weiss (94) Regulation of G-Protein-Coupled Receptor Signal Transduction Pathways

Assistants Professors
Robert B. Bourret (95) Molecular Mechanisms of Signal Transduction in Bacteria
Ann Campbell Burke (74) Role of Development Mechanisms in the Evolution of Vertebrates
Robert J. Duronio (57) Genetics of Cell Cycle Control During Drosophila Development
Sarah R. Ganz (107) Genetics of Sex Determination in Flowering Plants
Beverly H. Koller (92) Generating Animal Models of Human Diseases
Lian Li (91) Molecular Neurobiology; Gene Regulation; Synapse Formation; Neurotransmitter Release; Gene Targeting
Mark A. Peifer (93) Cell Adhesion and Transcriptional Regulation in Drosophila
Jason W. Reed (108) Plant Development, Light Responses, Nodulation
Lishan Su (109) Infrathymic T Cell Development, HIV-1 Pathogenesis, Hematopoietic Stem Cell (HSC) Based Gene Therapy
Christopher E. Walsh (111) Genetic Correction of Inherited Hematopoietic Stem Cell Disease
Brent W. Weston (112) Molecular Genetics of Glycosyltransferases; Tumor Cell and Leukocyte Adhesion
Yue Xiong (78) Cancer Biology, Mammalian Cell Cycle, Tumor Suppressor Genes

Adjunct Professor
J. Carl Barrett (31) Chemical Carcinogenesis, Mutagenesis of Mammalian Cells in Culture

Adjunct Associate Professors
Michael A. Resnick (40) Roles of Various DNA Repair in Meiosis
Roger W. Wiseman (110) Breast-Ovarian Cancer Susceptibility, Molecular Genetics

Professors Emeriti
John B. Graham
William S. Pollitzer
Maurice Whittinghill

The Curriculum in Genetics and Molecular Biology is an interdepartmental 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 adviser 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 nine 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 complimentation, 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 highest 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 three 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, and 112 (BIOL 161, Principles of Genetic Analysis), act 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, gene sequence and organization, biochemistry, and genetics, and regulatory mechanisms. Three lecture hours a week. Fall. Crews, Van Dyke, Xiong, Mariluff.

**108 MOLECULAR AND CELLULAR BASIS OF MICROBIOLOGY** (Microbiology 105) (3). Prerequisites, organic chemistry, permission of the department except for department majors. Basic concepts of the structure, metabolism, growth and reproduction, genetics, and control and regulation of prokaryotes and single-cell eukaryote systems. Three lecture hours. Fall. Cannon, staff.

**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. Matson, 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. Kole, Fried, Baldwin.

**112 PRINCIPLES OF GENETIC ANALYSIS** (Biology 161) (3). Prerequisites, for undergraduates, Biology 53 and permission of the instructor; for graduate students, an undergraduate genetics course or permission of the instructor. Analysis of recombination and other genetic interactions in prokaryotes, eukaryotes, and viruses. Three lecture hours a week. Fall. Petes, Pringle.

**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, Pukkila.

**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). Prerequisite, 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. Bauch, 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). Prerequisite, graduate students. Genetics 112 or at least one undergraduate genetics course or permission; undergraduates: at least one 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. Spring. (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 and two week intensive courses are part of the series of Carolina 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. Litaker and staff. 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 cellular 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 MICROBIOCHEMISTRY AND GENETICS (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. Bott.

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). Prerequisite, 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. Maroni, Pukkila.

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.
DEPARTMENT OF GEOGRAPHY

Leo E. Zonn, Chair

Professors
Lawrence E. Bond (21) Geographic Information Systems, Hydroecology, Geomorphology
Stephen S. Birdsell (5) Social Geography, North America
Wilbert M. Gesler (11) Health Care, Cultural, Africa, Quantitative
David E. Greenland (20) Climatology, Bio Climatology
James H. Johnson Jr. (15) Urban, Social, Population
Melinda S. Meade (10) Medical Geography, Population, and Southeast Asia
Risa I. Palm (22) Natural Hazards, Urban Social
Peter J. Robinson (9) Climatology, Climatic Impacts
Stephen J. Walsh (12) Remote Sensing, Geographic Information Systems, Physical
Leo E. Zonn (19) Cultural, Media, Environmental Perception, Landscapes

Associate Professors
John W. Florin (8) Population, Medical, Historical Anglo-America
Thomas M. Whitmore (13) Cultural Ecology, Latin America, Population

Assistant Professors
Altha J. Cravey (17) Latin America, Social
Charles E. Konrad (16) Synoptic Climatology and Meteorology
Aaron Moody (18) GIS, Biogeography

Adjunct Professors
Peter L. Finkelstein, U.S. Environmental Protection Agency
Sharon K. LeDuc, U.S. Environmental Protection Agency

Adjunct Associate Professor
Jerald D. Bales, U.S. Geological Survey

Adjunct Assistant Professors
Ellen J. Cooter, U.S. Environmental Protection Agency
Sain Pearsall, Nature Conservancy

Professors Emeriti
David G. Batelle
Clyde E. Browning
John D. Eyre
Richard J. Kopec

The Department of Geography offers other graduate work leading to the degrees of Master of Arts and Doctor of Philosophy. The Geography Department is located in Saunders Hall. Here are faculty and graduate student offices, research and instructional laboratories and some classrooms. Among University resources that Geography graduate students use are Wilson Library's Map Room, which houses sheet maps; and the University's strong collection of domestic and foreign geographical periodicals.

Geographers are concerned with an analysis of the spatial aspects of cultural and physical phenomena, their interrelationships, and their composite expression in the form of regions. They find employment in teaching and a number of professional and applied fields. Government agencies offer a variety of opportunities in such fields as cartography and map analysis, remote sensing and geographic information systems, census work, map interpretation, resource and land-use surveys, and foreign area intelligence. Industrial concerns, medical facilities, property development and management firms, research organizations, and federal, state, and municipal agencies employ sizable numbers of geographers as field investigators, location analysts, and planners. The expanding national recreation and travel fields also have job opportunities.

A student beginning graduate study in geography is generally required to hold a bachelor's degree in geography. However, a student who has achieved a good record as an undergraduate in another major field may be accepted for graduate study in geography. In such cases, some prerequisite course work is usually added to minimum M.A. requirements.

Graduate study is offered in a variety of systematic specialties. Under the guidance of an advising committee, students can select programs tailored to their interests from offerings within the department or from interdisciplinary curricula. Although the department stresses training in climatology, geographic information systems and remote sensing for physical and resource management, social, population and medical geography, students can elect topical and regional study programs from those listed under faculty specializations. Research groupings capitalize on courses of sister departments as well as those of nearby Duke University and North Carolina State University.

For the degree of Master of Arts a student must complete at least thirty hours of course work. This total must include Geography 190, 202, 393, one seminar course, and three substantial (topical or regional) courses. The remaining hours may be taken either inside or outside the department. The number and type of such supporting courses will be established through consultation between the student and his or her graduate advisers.

For the degree of Doctor of Philosophy a student must complete at least thirty hours of course work (including Geography 202 and three seminars) in addition to Geography 394. Ph.D. students will also be expected to have at least four courses in substantive geography in their background. The courses to be taken, in geography or any other appropriate discipline, will be established through consultation between the student and his or her advisers. It is possible to do joint course work leading to a Master of Public Health degree.

The student must demonstrate competence in a research skill or skills to be selected in consultation with the adviser. For the M.A., this requirement may be met by passing a reading examination or passing graduate courses in one foreign language (usu-
ally French, German, or Spanish); or by passing two sequential
courses from a selected list, usually in Statistics, Mathematics,
Computer Science, Spatial Techniques, or Demography. Ph.D.
students must demonstrate competence in two such skills.

Assistantships are available to qualified students. Out-of-state
students may be entitled to a remission of out-of-state tuition.
Duties consist primarily of preparation for and supervision of sec-
tions of introductory physical (Geography 10 or 11) and cultural
(Geography 20) courses and assisting professors with their
research. Some additional funds (e.g., NSF and other funding
agencies, and University Fellowships) are also available.

Courses for Graduates and Advanced
Undergraduates

103 ECOCLOGICAL PLANT GEOGRAPHY (Biology 143) (3).
Prerequisite, Biology 143. 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.) 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 geographic and biogeographic processes and tech-
niques within a thematic framework. Staff.

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. Konrad, Robinson.

116 APPLIED CLIMATOLOGY (3). Prerequisites, GEOG 112 or
114. Students investigate the ways climatic information and techniques
are applied to societal problems such as energy production, food pro-
duction and health. Discussion of case studies utilizing North Carolina
data. Konrad, Robinson.

119 TERRAIN ANALYSIS (3). Terrain analysis involves the evalua-
tion of landscape forms and function. Course emphasizes integration of
physical geography and remote sensing and GIS for terrain evaluation.
Moody, Walsh.

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 loca-
tion analysis within a thematic rather than a regional framework. Florin.

122 GEOGRAPHY OF INTERNATIONAL BUSINESS AND
TRADE (3). Describes and explains the internationalization of economic
activities. Examines major forces involved in the complex interaction
between transnational corporations and states within the context of a
changing technological environment.

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, Gesler, Johnson.

128 URBAN GEOGRAPHY (3). A geographical study of the spatial
structure and function of urban settlements. Emphasis is on the regional
relations of cities and central place theory. Johnson.

132 THE WORLD'S FOOD SUPPLY (3). Students study the envi-
rnmental parameters, cultural preferences, technological developments,
and spatial economic infrastructure which result in world patterns of food
consumption, production, and distribution. Meade, Hawley.

134 THE CULTURAL ECOLOGY OF AGRICULTURE AND
DISEASE (3). Examines the role of interactions of cultures, environ-
ments, and human diseases in the quest for sustainable agriculture by
examining the cultural ecology of systems and their human diseases.
Meade, Whitmore.

137 NATURAL RESOURCES (3). An analysis of selected biological
and mineral resources of the world with particular emphasis on their dis-
tribution, utilization, management policies, and on their social and eco-
omic implications. Hawley.

144 LANDSCAPE BIOGEOGRAPHY (3). This course is concerned
with the application of geobiogeographical principles and techniques to the
study of natural and human-modified landscapes. It includes local and
extraregional case studies. Butler.

145 MEDICAL GEOGRAPHY (3). Students study the human ecology
of health by analyzing the cultural/environmental interactions that lie
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.

150 POPULATION GEOGRAPHY (3). A study of the spatial dimen-
sions of population growth, density and movement, and of the shifts in
these patterns as they relate to changes in selected socioeconomic envi-
ronmental and cultural phenomena. Florin, Meade, Whitmore.

153 POLITICAL GEOGRAPHY (3). 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.

154 HISTORICAL GEOGRAPHY OF THE UNITED STATES
(Folklore 134) (3). A study of selected past geographies of the United
States with emphasis on the significant geographical changes in population,
cultural, and economic conditions throughout. Florin.

157 GEOGRAPHY OF AGRICULTURE IN LATIN AMERICA
(3). The course covers Pre-Columbian and colonial agriculture; the distri-
bution of agroecological regions; the nature of adaptation and technology
in traditional agriculture; and problems and opportunities in modern agri-
culture of Latin America. Whitmore.

159 GEOGRAPHY OF LATIN AMERICA (3). A study of countries
in the western hemisphere south of the United States. Emphasis placed
on their resources and economic activities as well as those aspects of the
physical and cultural environments that provide an understanding of their
political character. Whitmore, Cravey.

161 THE SOUTH (3). Present-day southern United States,
approached historically through a study of its physical, economic, and cul-
ar environment. Florin.

164 EUROPE TODAY (3). A survey by topic and country of Europe
west of Russia. Those features that made Europe a distinct and important
region today are emphasized. Hawley.

166 EASTERN ASIA (3). Students study the geographical structure of
population, urbanization, agriculture, industrialization and regional links
in China, Japan, and Korea.

167 TROPICAL ASIA (3). The cultural diversity and regional organi-
ization, emphasizing the spatial structure and contemporary dynamics of
population, agriculture, urbanization, and economic development, primar-
ily of the nations of Southeast Asia. Meade.

168 AFRICA (3). This course emphasizes the dynamic spatial organi-
sation of Africa south of the Sahara. Individual countries will be studied in
view of their geographic characteristics and problems. Gesler.

173 GEOGRAPHIC INFORMATION AND ANALYSIS (3).
Prerequisite, Geography 70 or equivalent. This course introduces students
to spatial analytical techniques including computer mapping, remote
sensing, and geographic information systems. Walsh, Moody.

177 INTRODUCTION TO REMOTE SENSING AND DIGITAL
IMAGE PROCESSING (3). Introduces students to remote sensing of
human and physical patterns on the earth's surface from aircraft and
spacecraft. Emphasis is on the interpretation of imagery from imaging
scanners and camera systems. Walsh.
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 TECHNICAL ISSUES IN GEOGRAPHIC INFORMATION SYSTEMS (Planning 136) (3). Prerequisite, Geography 173. Stresses the spatial analysis and modeling capabilities of organizing data within a geographic information system. Moody, Walsh.

192 APPLIED ISSUES IN GEOGRAPHIC INFORMATION SYSTEMS (3). Prerequisite, Geography 173 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 THE DESIGN OF GEOGRAPHIC RESEARCH (3). History and philosophy of geographic discipline. Basic elements of scientific inquiry, methods of spatial analysis, and selection and formulation of research topics. Whitmore.

205 ADVANCED QUANTITATIVE METHODS IN GEOGRAPHY (3). Application of selected multivariate statistical techniques to the analysis of geographic phenomena and problems. Gesler.

209 THE GEOGRAPHY OF HEALTH CARE DELIVERY (3). Students examine the spatial aspects of United States and other health care delivery systems. The course presents theoretical and empirical developments in health care resources distribution, location and allocation, accessibility, and utilization. Gesler.

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.

211 SPECIAL WORK IN GEOGRAPHY (2 or more). Prerequisites, two courses in the one hundred bracket, or permission of the instructor. (On demand.) Staff.

240 ADVANCED REGIONAL GEOGRAPHY (3). Selected features, developments and problems of human geography in major world regions. (On demand.) Staff.

245 GEOGRAPHY AND A CROWDED WORLD (3). Prerequisite, Geography 132 or 145 or 150 or permission of instructor. Cultural and environmental changes in human population ecology related to development and technological change. Students study the context of environment and resources for food systems, human health, and settlement. Meade.

251 URBAN MICROSpatial GEOGRAPHY (3). Analysis of selected theories accounting for the spatial pattern of urban residential and nonresidential land use. Students examine analog growth and distribution.

274 PROBLEMS IN CARTOGRAPHY (3). Students apply mapping methods and techniques to spatial problems. The utility of maps as problem-solving devices is emphasized.

277 ADVANCED REMOTE SENSING: SATELLITE IMAGE PROCESSING (Geography 277 and Planning 235) (3). Prerequisite, Geography 173 or equivalent. Acquisition, processing, and analysis of satellite digital data for the mapping and characterization of land cover types. Walsh, Moody.

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.

302 SEMINAR IN ECONOMIC GEOGRAPHY (3). Johnson.

303 SEMINAR IN GEOGRAPHIC INFORMATION SYSTEMS (3). Walsh.

304 SEMINAR IN POLITICAL GEOGRAPHY (3).

305 SEMINAR IN HISTORICAL GEOGRAPHY (3). Florin.

306 SEMINAR IN REGIONAL GEOGRAPHY (3). Staff.

307 SEMINAR IN URBAN GEOGRAPHY (3). Birdall, Johnson, Moriarty.

308 SEMINAR IN PHYSICAL GEOGRAPHY (3). Konrad, Robinson, Walsh.

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 ways landscapes come to have meaning for individuals and groups and the means by which landscape meaning is shared. Staff, Gesler.

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.

314 SEMINAR IN CLIMATOLOGY (3). Examines questions of global climate change, climate modeling, climate telecommunications, and climate patterns. Staff.

317 SEMINAR IN REMOTE SENSING (3). Prerequisite, Geography 173 or 177. Selected topics in the field of advanced remote sensing. Spring.

391 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.

400 GENERAL REGISTRATION (0).
DEPARTMENT OF GEOLOGY

PAUL D. FULLAGAR, Chair

Professors
John M. Bane Jr. (24) Physical Oceanography
Larry K. Benninger (17) Geochemistry
Joseph G. Carter (15) Paleocology, Invertebrate Paleontology
John M. Dennison (2) Paleoecos Estratigraphy
Paul D. Fullagar (4) Isotope Geochemistry, Geochronology
Allen F. Glaze (20) Igneous Petrology, Tectonics
Christopher S. Hartman (7) Chemical Oceanography
A. Conrad Neumann (16) Geologic Oceanography
Charles K. Paul (28) Continental Margins, Stratiagraphy
Christine A. Powell (18) Geophysics, Seismology
John T. Wells (25) Coastal Geomorphology, Sedimentation

Associate Professors
Timothy J. Bralower (30) Micropaleontology
Jose A. Rial (26) Geophysics, Seismology
Kevin G. Stewart (27) Structural Geology

Assistant Professor
Charles E. Jones (35) Paleocceanography and Paleoclimatology

Adjunct Associate Professors
Charles C. Daniel III (33) Hydrology
Charles B. Well, Sedimentology

Professors Emeriti
Roy L. Ingram
John J. W. Rogers
Joseph St. Jean Jr.
Daniel A. Textoris
William A. White

The Department of Geology offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy. The Department of Geology also participates in the interdepartmental curricular programs in marine sciences and environmental sciences.

The faculty are prepared to direct the study and research of graduate students in carbonate petrology, geochemistry and geochronology, igneous petrology, marine geology and geochemistry, paleontology and paleocology, sedimentology and stratigraphy, seismology, and structural geology and tectonics. A booklet of the faculty's research and teaching interests is available upon request from the student services assistant, Department of Geology, CB# 3315, Mitchell Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3315 (pwebb@email.unc.edu).

Departmental information may be found on the World Wide Web at www.geosci.unc.edu/web.

Admission and General Degree Requirements

Students applying for admission to graduate studies normally should have completed an undergraduate degree with a major in geology. Students with majors in other sciences, engineering, or mathematics are given equal consideration for admission; however, such students should expect to spend one or more semesters taking basic geology courses for which graduate credit cannot be given.

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 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. All geology students must have had, or must take, introductory geology, geology with a historical perspective, mineralogy, petrology, structural geology, one year of college chemistry (with laboratory), one year of college physics (with laboratory), one year of college calculus, and a geology field course or equivalent professional field experience. Approval of the equivalent professional field experience must be given by the geology faculty. Geophysics and geochemistry concentrators generally should have completed the same basic course requirements as geology majors with the exception of the geology field course, for which physics and chemistry courses, respectively, may be substituted.

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 geology faculty.

Admission to the Ph.D. program after completing the M.S. degree in the Department of Geology at UNC-Chapel Hill requires the approval of the geology faculty.

Requirements for the Ph.D. degree are: a minimum of forty-five semester hours of graduate credit (which includes thirty hours for the M.S. degree) plus a minimum of three 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 Geology occupies the 50,000 square feet of floor space in Elisha Mitchell Hall. The Geology Library contains over 49,000 volumes and over 50,000 topographic and
geologic maps, and regularly receives 850 serial publications. Access to GeoRef and other databases is available through the online catalog and CD-ROMs.

Research equipment and facilities include: Micromass Sector 54 thermal ionization mass spectrometer; Class 100 clean lab; direct current plasma spectrometer; Cameca electron microprobe (at Duke University); ICP mass spectrometer (at Duke University); X-ray diffraction; flame- and graphite-furnace atomic absorption spectrometer; scanning electron microscope; one-atmosphere gas-mixing furnaces; fluid-inclusion heating/freezing stage; counting laboratory (alpha-, beta-, and gamma-emitting radionuclides); gas-, liquid-, and ion-chromatography equipment; carbon/nitrogen/sulfur analyzer; benzene synthesis 14C laboratory; percent carbonate and percent organic C facility; preparation lab for d18O and d13C; gas chromatograph-combustion-isotope ratio mass spectrometer; MacCarthy Geophysical Laboratory, including nineteen seismometers and the North Carolina Seismic Network; magnetometer; gravimeter; electrical resistivity apparatus; petrographic, ore, and binocular microscopes; particle size analyzer; thin section and polishing equipment; cameras and darkroom; drafting facilities; machine shop; vehicles and boat for field work. The department has NeXT, SUN, and MicroVAX workstations, plus access to the IBM mainframe campus computer and NC Supercomputer. Macintosh and IBM PC (and compatible) microcomputers, with a variety of software, are located throughout the department, and most offices and labs are connected to the campus broadband network.

Financial Aid

About seventeen graduate and teaching assistantships with stipends of $11,000-$12,600 per academic year (1997-1998 stipends) are available to graduate students. Some research assistantships supported by faculty research grants are available. Remission of out-of-state tuition is available for recipients of assistantships. Graduate students in geology who are recommended by the department for non-service fellowships are given full consideration by the Graduate School; no additional application is necessary.

Courses for Graduates and Advanced Undergraduates

101 OCEANOGRAPHY (MASC 101, BIOL 126, ENVR 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, Neumann; spring, staff.

102 ARCHAEOLOGICAL GEOLOGY (ANTH 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, geologic 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. Not scheduled to be taught.

106 PHYSICAL OCEANOGRAPHY (MASC 106) (4).
Prerequisites, Math 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.

115 ECONOMIC GEOLOGY (4). Prerequisites, Geology 56, 57, 58.
An introduction to metallic ore deposits. Emphasis is placed on their description, origin, and distribution. Three lecture and two laboratory hours a week. Spring. Staff. Not scheduled to be taught.

121 PRINCIPLES OF GLOBAL DYNAMICS (3).

122 PHYSICS OF THE EARTH'S INTERIOR (PHYS 122) (3).

123 MARINE CARBONATE ENVIRONMENTS (MASC 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) Neumann, Crenshaw.

125 COASTAL SEDIMENTARY ENVIRONMENTS (MASC 125) (3).
Prerequisite, Geology 56. 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.

127 GEOLOGICAL RESEARCH TECHNIQUES (1-4).
Prerequisite, permission of the instructor. An introduction to methods of obtaining, analyzing, and presenting geologic and paleontological data. Fall and spring. Carter.

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 geologic maps; introduction to hydrology. Includes field trips to classic localities such as the Grand Canyon. First summer session only. Staff.

130 TOPICS IN PHYSICAL GEOLOGY (Var.). A two-week workshop concentrating on an in-depth evaluation of topics typically covered in high school earth science courses. The course emphasizes background material needed for teachers to teach these subjects, materials (audiovisual, readings, lab materials, etc.) available for classroom use, and supplemental demonstrations, labs, and in-class and field exercises that can be used. Depending on teacher interest, some evaluation and design of science fair projects may be addressed. Summer. Staff. Not scheduled to be taught.

132 INVERTEBRATE PALEONTOLOGY (BIOL 110) (4).
Prerequisite, Geology 16 or Biology 11, or permission of the instructor. A survey of the major invertebrate phyla represented in the geologic record, with emphasis on broad skeletal morphology, evolutionary trends, ecology, and biostatigraphic significance. Three lecture and two laboratory hours a week. Fall. Carter.
133 MICROPALEONTOLOGY (MASC 133) (4). Prerequisite, Geology 132, Marine Sciences 146, or permission of the instructor. An in-depth study of the biostriatography, paleoecology, and taxonomy of various microfossil groups (i.e., Foraminifera, ostracodes, conodonts, coccoliths, Radiolaria, diatoms, acritarchs, dinoflagellates, etc.) dependent upon individual student objectives. Three lecture and three laboratory hours a week. (On demand.) Balchower.

137 COASTAL PLAIN STRATIGRAPHY AND BIOSTRATIGRAPHY (4). Prerequisites, Geology 11, 16, 18 or 41 and Geology 57 or 132, 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 biostatigraphic 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, dissolution 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 turbidite fan. Focus on stream processes, geologic development, hydrology, utilization history, ecology, and planning. Spring. (Alternate years.) Dennison.

140 BIOGEOCHEMICAL CYCLING (MASC 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, Amisoti.

141 MODELING OF MARINE AND EARTH SYSTEMS (MASC 152) (1-3). Prerequisites, Math 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 SHALLOW SURFACE GEOPHYSICS (3). Prerequisites, Physics 24 and 25. Exploration of the earth’s near surface using remote sensing techniques including seismology, gravity, magnetics, ground penetrating radar, and electromagnetic methods. Application of the methods to geological and environmental problems. Fall. Powell.

142L SHALLOW SURFACE GEOPHYSICS LABORATORY (1). Prerequisite or corequisite, Geology 142. Three laboratory hours a week. Fall. Powell.

143 DESCRIPTIVE PHYSICAL OCEANOGRAPHY (MASC 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.) Baner.

144 ORGANIC GEOCHEMISTRY (MASC 144) (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.) Arnott.

145 GEOCHEMISTRY (MASC 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 isotope methods. Spring. (Alternate years.) Benninger.

146 PHYSICAL GEOCHEMISTRY (4). Prerequisites, Chemistry 21, Math 32, or permission of the instructor. An introduction to physical geochemistry and chemical thermodynamics with special emphasis on geological applications. Three lecture and three laboratory hours a week. Fall. (Alternate years.) Benninger.

150 HISTORY OF THE EARTH (3). Prerequisites, Geology 11, 13, 15, 18, or 41 and 52, 53, 56, 57, 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. Balchower, Rogers.


157 PROBLEMS IN VERTEBRATE EVOLUTION (BIOL 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.) Peduccia.

162 ENERGY RESOURCES (3). Prerequisites, Geology 11 or 41, or 57. Geology of oil, natural gas, uranium, hydropower, and geothermal energy. Spring. (Alternate years.) Dennison.

162L ENERGY RESOURCES LABORATORY (1). Prerequisite or corequisite, Geology 162. Laboratory problems and field trips related to Geology 162. Three laboratory hours a week. Spring. (Alternate years.) Dennison.

163 APPLIED HYDROLOGY (3). Prerequisites, Geology 11 or 41, Math 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, Math 31, or permission of the instructor. Survey of processes affecting the compositions of streams, lakes, the ocean, and shallow groundwaters. Spring. (Alternate years.) Benninger.

165 GROUNDWATER (3). Prerequisites, Geology 11, 13, 15, 18, or 41, Chemistry 21, Math 31, Physics 24, 26, or permission of the instructor. Introduction to physics, chemistry, and geology of groundwater. Fall. (Alternate years.) Benninger.

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. Glanzer.

181 FLUID DYNAMICS (MASC 151, PHYS 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.

184 ADVANCED FIELD SEMINAR IN GEOLOGY (14). 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.) Glanzer.
188 GEOLOGICAL OCEANOGRAPHY (MASC 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; paleo-oceanographic reconstructions are emphasized. Three lecture and two laboratory hours a week. Fall. Neumann.

197 PALEOBOTANY (BIOL 181) (5). Prerequisites, Biology 11-11L 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.) Gensel.

199 SPECIAL PROBLEMS IN GEOL OGY (1-4). Independent research under the direction of a geology faculty member on an interesting geologic topic. Registration requires the approval of the department chair. Fall and spring. Staff.

Courses for Graduates

202 SEDIMENTARY GEOLOGY I (3). Prerequisites, Geology 56, 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. Bralower, Jones, Paull.


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.


216 PALEOCEANOGRAPHY (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 oceanic atmosphere system. Fall. Paull.

225 CLASTIC SEDIMENTOLOGY (4). Prerequisites, Geology 56 and 57, or permission of the instructor. An introduction to the study of sedimentary processes and depositional systems. Systematic coverage of modern clastic sedimentary environments and facies, with extensive reference to sedimentary sequences in the rock record. Three lecture and two laboratory hours a week. (On demand.) Staff.

227 CLAY MINERALOGY (4). Prerequisites, Geology 53 and 56. Includes X-ray diffraction studies of clay minerals. Two lecture and four laboratory hours a week. (On demand.) Staff.

228 SEDIMENTARY TECTONICS (4). Prerequisite, Geology 57 or permission of the instructor. Tectonic controls on sedimentation and the evolution of sedimentary basins. Theory and techniques of provenance analysis, as well as models of basin development and thermal history, are considered from tectonic and sedimentological perspectives. Three lecture and two laboratory hours a week. (On demand.) Staff.

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.

251 STATISTICAL ANALYSIS (1-3). Prerequisites, Math 31 and 32. Introduction to the concepts of using statistical analysis in problems in the earth sciences. Fall. Rogers.


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 isotopic methods in igneous petrology, using case studies from current literature. Three lecture and three laboratory hours a week. (On demand.) Glazner.

272 METALLIC ORE DEPOSITS (4). Prerequisites, Geology 115 or equivalent and Geology 146. An introduction to modern theories of ore genesis. Topics include thermodynamics of aqueous sulfide systems, geothermometry, and geobarometry, stable and radiogenic isotopes, lithogeochemistry and the distribution of metals in the earth's crust. Laboratory emphasis on microscopy. Three lecture and three laboratory hours a week. (On demand.) Staff.


280 TECTONOPHYSICS (3). Prerequisites, Math 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.) Powell.

282 ADVANCED STRUCTURAL GEOLOGY (3). Prerequisites, Geology 58, Physics 24, 25, Math 32 and 116, or equivalent. Theoretical and experimental methods in structural geology; strain analysis; mechanical behavior of rocks. Fall. (Alternate years.) Stewart.

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. Fall. Staff.

301 SEMINAR (1 or more). Will be offered as required. Staff.

302 SEMINAR IN STRATIGRAPHY (1 or more). Will be offered as required. Staff.

306 SEMINAR IN PALEOECOLOGY (1 or more). Will be offered as required. Staff.
310 SEMINAR IN PALEONTOLOGY (1 or more). Will be offered as required. Staff.
318 SEMINAR IN CONTINENTAL MARGINS (1 or more). Will be offered as required. Paul.
320 SEMINAR IN SEDIMENTOLOGY (1 or more). Will be offered as required. Staff.
345 SEMINAR IN GEOCHEMISTRY (1 or more). Fall, spring. Benninger.
357 SEMINAR IN ISOTOPE GEOLOGY (1 or more). Will be offered as required. Fullagar.
360 SEMINAR IN PETROLOGY (1 or more). Will be offered as required. Staff.
372 SEMINAR IN ECONOMIC GEOLOGY (1 or more). Will be offered as required. Staff.
380 SEMINAR IN GEOPHYSICS (1 or more). Will be offered as required. Powell, Rial.
381 SEMINAR IN SEISMOLOGY (1 or more). Will be offered as required. Powell, Rial.
382 SEMINAR IN STRUCTURAL GEOLOGY (1 or more). Will be offered as required. Stewart.
383 SEMINAR IN TECTONICS (1 or more). Will be offered as required. Rogers.

Research Courses
392 RESEARCH IN GEOLOGY (1 or more).
393 MASTER’S THESIS (1 or more).
394 DOCTORAL DISSERTATION (1 or more).
400 GENERAL REGISTRATION (0).

DEPARTMENT OF GERMANIC LANGUAGES
CLAYTON KOELB, Chair

Professors
Clayton Koelb (20) Modern Literature, Literary Theory, Comparative Literature
Siegfried Mews (5) Nineteenth- and Twentieth-Century Literature, Comparative Literature
David Pike (15) Twentieth-Century Literature, GDR Literature, Literature and Politics
Paul T. Robarge (18) Historical Linguistics, Older Germanic Dialects, Comparative Germanic Grammar, Pidgins and Creoles, Afrikaans, Language, Ethnicity, and Politics

Associate Professors
Helga Bister (19) Dialectology, Contact and Sociolinguistics, Applied Linguistics
Walter K. Francke (9) Medieval German Literature, Modern German Literature
Alice A. Kumari (17) Romanticism, Film and Film Theory, Gender Studies, Queer Studies
Marilyn Scott (13) Austrian Literature and Culture, Nineteenth- and Twentieth-Century Literature, Lyric

Assistant Professors
Jonathan Hess (21) Eighteenth-Century Studies, Aesthetics and Literary Theory, Philosophy and Literature, German-Jewish Cultural History
Christopher Wild, Early Modern Culture and Literature, Eighteenth-Century Studies, Medicine and Literature, Literary Theory

Associated Faculty
Gert Weibelthum, Syntax of Germanic Languages, Syntactic Theory

Professors Emeriti
Richard H. Luhnow
Christopher E. Schweitzer
Sidney R. Smith
Petrus 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 205A-B).

Prospective students should request from the department chair a copy of the document Guide to Graduate Studies in German, which describes in detail departmental curricula and requirements.

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) are required, and they must include German 100 (unless waived), 160, 205A-B, and 393 (M.A. thesis credit). Students concentrating in German literature 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 take the 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 Germanist 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 sixty semester hours, which includes the semester hours earned for the M.A. degree. This typically amounts to nine courses beyond the M.A. degree (if received from UNC-Chapel Hill) with an additional three 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 adviser 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. The only specific course requirement beyond those obligatory for the M.A. degree is German 271 (Middle High German). Literature courses at the 100 level provide a firm foundation in the principal movements and authors of selected periods. While these courses are not surveys and do not cover every author and work of significant interest, they do offer representative coverage. Courses at the 200 level, by contrast, are organized around specific topics and are therefore more specialized. A topic might be a particular author, genre, issue, or field of critical inquiry.

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 who have not completed the equivalent of German 100 and German 160 must take these courses during their first semester in residence; they take German 205A-B 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-service fellowships awarded by the Graduate School. One Merit Assistantship (sponsored by the Graduate School) is awarded by the department on a competitive basis to first-year graduate students; it involves ten to fifteen hours of service per week within the department. A varying number of teaching assistantships are awarded annually to qualified graduate students. Duties involve instructing German at the elementary or intermediate level. Awards generally carry with them remission of out-of-state tuition. Students offered assistantships are also eligible for Kent James Brown Fellowships, about twenty of which are awarded each year. To receive priority consideration for financial aid, applications must be received by January 31.

The duration of financial aid is usually two years at the master's level and 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.

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-Americana). 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. Smith; instructors. (NOTE: 101X is not a prerequisite for 102X.)

Courses for Graduates and Advanced Undergraduates

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. Bister.
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.

140 LATER TWENTIETH-CENTURY LITERATURE (3). Literature since World War II in the Federal Republic, the former GDR, Austria, and Switzerland.


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. Fall. Roberge.

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. Roberge.

172 PIGDINS AND CREOLES (3). Examination of the linguistic features of pidgin and creole languages, the sociohistorical context of their development, and their import for 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 (Alsace, 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.

**Dutch**

105 ELEMENTARY DUTCH (3). Prerequisite, reading knowledge of German or permission of the instructor. Rapid introduction to modern Netherlandic with emphasis on both speaking and reading. Fall. (Alternate years.) Francke.

106 INTERMEDIATE DUTCH (3). Prerequisite, Dutch 105 or equivalent. Reading of modern Dutch literature with discussions in Dutch. (Alternate years.) Spring. Francke.

**Scandinavian**

181 ELEMENTARY NORWEGIAN (3). Rapid introduction to modern Norwegian (bokmaal) with attention to both speaking and reading. Fall. (On demand.) Smith.

182 INTERMEDIATE NORWEGIAN (3). Prerequisite, Norwegian 181 or equivalent. Reading of twentieth-century short stories. Introduction to Danish and Swedish, with readings. Spring. (On demand.) Smith.

233 OLD NORSE I (OLD ICELANDIC) (3). Introduction to the language, with reading of mythology texts (prose Edda) and sagas about the discovery of America. Phonological development from Indo-European and Germanic; comparison with other Germanic dialects. (On demand.)

234 OLD NORSE II (OLD ICELANDIC) (3). Advanced readings, including a complete saga. Morphology of Old Norse, and comparison with other Germanic dialects. Survey of the language into modern times. (On demand.)

**Courses for Graduates**

205A TEACHING METHODS AND MATERIALS (2). For prospective teachers of German. Required of all teaching assistants. Fall. Bister.

205B TEACHING METHODS AND MATERIALS (2). Prerequisite, German 205A. For prospective teachers of German. Required of all teaching assistants. Spring. Bister.

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 EARLY TWENTIETH-CENTURY LITERATURE (3).

240 TOPICS IN LATER TWENTIETH-CENTURY LITERATURE (3).

245 TOPICS IN CULTURAL HISTORY (3).

250 TOPICS IN AESTHETICS AND CRITICISM (3).

255 GOTHIC (3). Reading and linguistic analysis of Gothic biblical texts. Introduction to Germanic linguistics, with emphasis on phonology and morphology; comparison with other older dialects of Germanic. (On demand.) Roberge.

260 OLD NORSE I (OLD ICELANDIC) (3).

261 OLD NORSE II (OLD ICELANDIC) (3).

270 OLD HIGH GERMAN (3). Roberge.

271 MIDDLE HIGH GERMAN (3). Prerequisite, German 160 (waived in special cases). Introduction to medieval German language, literature, and life. Spring. Francke.

272 EARLY NEW HIGH GERMAN (3).

275 OLD SAXON (3). Reading and linguistic study of biblical texts (Heliand) in Old Saxon, with study of phonology and morphology. Comparison with Old English, Old High German, and other Germanic dialects. (On demand.) Roberge.

280 COMPARATIVE GERMANIC GRAMMAR (3). Analysis of phonological and morphological development from Indo-European to the older stages of Germanic dialects. Special attention to laryngeal hypothes is, Benveniste root theory, and structure of nouns, pronouns, and verbs. Student presentations.

285 TOPICS IN GERMANIC LINGUISTICS (3).
DEPARTMENT OF HISTORY

Louis A. Pérez, Interim 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, esp. Medieval; Medieval England
Melissa M. Bullard (38) Renaissance, Mediterranean and Early Modern Europe
Stanley Chojnacki (29) Late Medieval, Renaissance (Especially Italy and Venice); European Women’s History
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
Leon R. Fink (94) American Labor History, Nineteenth-Twentieth Century Social History
W. Miles Fletcher (52) Japanese History
Robert E. Gallman (99) Economic 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, esp. Early Modern; Tudor-Stuart England
John M. Headley (31) Renaissance, Reformation, Seventeenth-Century Continental Europe
R. Don Higginbotham (84) Colonial and Revolutionary America
Sylvia D. Heffert (72) Women’s Studies
Gerald C. Horne (76) African and Afro-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
Lawrence D. Kessler (51) Chinese History: Seventeenth-Century Political and Social, Revolutionarionary Experience since 1919, Modern U.S.-Chinese Relations
Richard H. Kohn (82) Military History
Lloyd S. Kramer (39) European Intellectual History
Roger W. Lotchin (81) Urban Political History, 1800 to the Present
Genna Rae McNeil (86) Afro-American History
Michael R. McVaugh (15) History of Science
John K. Nelson (78) Social, Intellectual, Religious Development of America before the Revolution
Louis A. Pérez (46) 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. Somone (77) American Legal and Constitutional History
Richard A. Soloway (23) Nineteenth-Century Britain: Social, Intellectual, and Church History
Richard J. A. Talbert (18) Ancient Rome, Classics
Harry L. Watson (93) North Carolina History
Joel R. Williamson (79) History of the South, Race Relations

Associate Professors
E. Willis Brooks (61) Russia in the Nineteenth Century: Social, Administrative, Intellectual
Charles H. Capper (89) American Intellectual and Cultural History, Antebellum U.S.
John C. Chasteeen (45) Latin America, Brazil
Reginald F. Hildebrand (75) African and Afro-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) Medieval European, Economic and Social
David S. Newby (53) Sub-Saharan Africa
Jay M. Smith (34) France 1550-1815

Assistant Professors
Sarah C. Chambers (43) Colonial Latin America
Alison E. Isenberg (98) American Culture, Urban Planning, and Immigration
Katherine R. Jolluck (65) East European
Sarah D. Shields (55) Islamic Civilization
Keith Wailoo (71) Medicine, Science, and American Society in the Nineteenth and Twentieth Centuries

Semi-Retired Professors
William E. Leuchtenburg (99) Recent American History
Gerhard L. Weinberg (35) Modern Germany, Diplomatic History

Professors Emeriti
Josef Anderle
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
William S. Powell
Frank W. Ryan Jr.
George V. Taylor
George B. Tindall
Peter F. Walker

The Department of History offers programs of master’s and doctoral study in eleven distinct degree fields: Ancient History; Great Britain; History of Science; History of Women; Late Medieval and Early Modern Europe; Latin America; Medieval; Military History; Modern Europe; Russia and Eastern Europe; and United States. Although a program must fall within one of these fields, students may select supplementary courses outside a field or vary the emphasis within a field according to their own interests.

The courses required for the M.A. degree 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 (numbered between 203 and 209), usually also taken
in the first year; 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.
The student must also pass a reading-knowledge examination in
an appropriate foreign language, prepare an acceptable thesis,
and pass an oral examination on the thesis. A student who, after
four semesters in residence, has not completed the requirements
for the M.A. shall not be permitted to enroll for further course
work until the requirements for the degree have been completed.
Every graduate student in the department without an M.A. in
history is considered a candidate for the master's degree.
However, as the student nears the completion of eighteen hours
of course credit, he or she in consultation with the faculty
adviser may petition to bypass the M.A. and proceed directly to
the Ph.D. In practice the great majority of candidates are
expected to take the M.A., and the exceptional student who
wishes to bypass must secure the approval of his or her adviser,
the Graduate Studies Committee, and the Graduate School. A
student admitted to the department with an M.A. from another
university will be reviewed by the staff of his or her field before
he or she completes the second semester of study here, and at
that time it will be determined whether the student must com-
plete an M.A. degree here or whether he or she may proceed
directly to the Ph.D.
The M.A. is a terminal degree and satisfactory completion of
it does not automatically entitle a student to continue on to the
Ph.D. At the time of the oral examination or at least within two
weeks after it and before the student registers for the following
semester, the student's committee, augmented where desirable by
other faculty members with whom the student has worked,
should decide whether or not he or she will be allowed to con-
tinue towards the Ph.D.

All students who apply for the Ph.D. program are expected to
have completed an M.A. as described above or to have obtained
permission from the department and the Graduate School to
bypass that degree. All courses taken here for the M.A. (except
History 393) may be credited towards the doctoral program.
Graduate courses taken elsewhere which the Graduate School
approves for transfer credit may be credited as well, but they
must be validated at the time of the preliminary oral examina-
tion. The doctoral candidate must complete four semesters of
fully enrolled residence credit of which at least two must be in
continuous residence here; and all work credited towards the
Ph.D., including transfer course work, must be completed within
a period of eight years. All required course work must be com-
pleted by the end of the sixth semester of residence during the
regular academic year, and the comprehensive written and oral
examinations must be taken by the end of the seventh; only in
the most exceptional circumstances may the examinations be
delayed until the eighth semester. Candidates for the Ph.D. will
complete the following minimum course program (in addition to
the requirements for the M.A.): seminar; two courses in a second
field of study; research design (History 399); and dissertation
credit (History 394). A reading knowledge of two foreign lan-
guages is also required of the doctoral student.
The student must pass a written comprehensive examination
on the major field, as well as an oral examination that will focus
on the feasibility of the dissertation topic together with the stu-
dent's knowledge of the topic's chronological and thematic
contexts.
The final requirements for the Ph.D. are a dissertation and a
final oral examination, which is usually limited to a defense of
the dissertation and its historical setting.

**Fellowships and Assistantships**
The department is committed to funding a high proportion of
its students. Roughly half of the entering class and virtually all
students with strong records thereafter receive departmental sup-
port. Substantial additional funding comes from the Graduate
School both for entering students and for those in the research
and writing phase of their doctoral training.

**Library and Research Facilities**
The library has a number of special collections of great value,
and the University itself is conveniently situated close to a num-
ber of other research centers, particularly the Duke University
Library and the North Carolina State Department of Archives and
History.

Notable among the library's special collections are the
Southern Historical Collection (one of the most important in
the country devoted to the subject), and the North Carolina
Collection. Both are extremely rich in manuscripts, diaries, pam-
phlets, and newspapers. Other outstanding collections are the
Peabody Collection for international law and diplomacy; the
William Henry Hoyt Collection (devoted to the Napoleonic
period); and the Bowman Gray Collection (with materials on
World Wars I and II). In addition the library has extensive work-
ning collections in all the doctoral fields.

**Publications**
The James Sprunt Studies in History and Political Science
are published under the direction of the chairs of the History and
the Political Science departments. Established by the late Dr.
James Sprunt, of Wilmington, North Carolina, the series has at
present reached fifty-nine volumes. The contents have mainly
been concerned with North Carolina state and colonial history
and government, but by recent action the series has been
enlarged to embrace other areas of history and political science.
Publication in the Sprunt Studies is open to students as well as
specialists.

**Courses for Graduates and Advanced Undergraduates**

100 SPECIAL TOPICS IN HISTORY (3). Subject matter will vary
with instructor, but will focus on some particular topic or historical
approach. Course description available from departmental office. Staff.

101 ALEXANDER (3). The rise of Macedonia; the careers of Philip II
and Alexander; and the emerging Hellenistic Age. Fall or 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. Fall or 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. Fall or spring. 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. Fall or spring. Talbert.

104A THE EARLY ROMAN EMPIRE, 14 A.D.-193 A.D. (3). Focuses upon administrative, social, and economic themes. Conducted in considerable part by student reports and classroom discussions. Fall or spring. Talbert.


105 GREEK AND ROMAN HISTORICAL LITERATURE (CLAS 109) (3). The study in English translation of selections from Herodotus, Thucydides, Livy, Tacitus, and others with consideration of their literary qualities and their readability as historians. Fall. (Alternate years.) McCoy.


107 EUROPE IN THE EARLY MIDDLE AGES (3). A survey of the medieval world and northern Europe from the later Roman Empire until the end of the ninth century. Fall. (Alternate years.)

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. Spring.

109 MEDIEVAL THOUGHT AND LEARNING (3). A survey of the educational traditions and major (Latin) writers in Western Europe from late Roman times through the thirteenth century. Fall. (Alternate years.)

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/gown and student/master relationships. Spring. (Alternate years.) McCaugh.

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 gender; economic change and domestic roles. Spring. Choiznacki.

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. Fall. 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. Spring. Bullard.


115 EUROPE IN THE SEVENTEENTH CENTURY (3). The century marks the watershed in the European development. Emphasizes: statecraft, the emerging state-system, the new scientific world view, the impact upon European society. Spring. (Alternate years.) 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. Fall, spring. Smith.

117 THE FRENCH REVOLUTION, 1787-1815 (3). Collapse of the old regime, crisis of 1789, the first and second revolutions, the Terror in theory and practice, Thermidorean reaction, Directory, Napoleon and Napoleonic France, Revolutionary and Napoleonic imperialism. Spring. Smith.

118 EUROPE, 1871-1918 (3). Emphasizes the disintegration of Europe, culminating in the First World War and the fall of the continental empires. Fall or spring. (Alternate years.) Jarausch.

119 EUROPE SINCE 1918 (3). The main currents in European history since the First World War. Special attention given to the interaction between national and international events and developments and to the emergence of the European Communities. Fall. Weinberg.

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. Fall. 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, industrialization. Fall. Reid.

121 FRANCE SINCE 1870 (3). French society and culture from the Paris Commune of 1871 to the student revolt of May 1968. Fall or spring. (Alternate years.) 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. Fall. (Alternate years.) 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. Spring. Weinberg.

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. Spring. (Alternate years.) Headley.

125 INTELLECTUAL HISTORY OF EUROPE, EARLY PERIOD (3). The course examines the gradual erosion of and criticism within the classical Christian tradition that led to the emergence of a new mentality by the end of the seventeenth century. Two lectures, one discussion per week. Fall. 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, Tocqueville, Mill, Faubert, Nietzsche, Freud. Spring. 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. Spring. McIntosh.

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. Fall or spring. McIntosh.
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. Fall. (Alternate years.) 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. Fall. 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. Spring. 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. Fall. McVaugh.


133 ENGLISH ECONOMY AND SOCIETY, 1200-1700 (3). This course examines critical issues in the development of English society and economy in the centuries before industrialization. Spring. J. 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. Fall. Pfaff.

135 TUDOR AND STUART ENGLAND, 1485-1660 (3). A lecture course, open to juniors, seniors, and graduate students. Fall. Harris.

136 ENGLAND IN THE EIGHTEENTH CENTURY, 1660-1815 (3). A lecture course, open to juniors, seniors, and graduate students. Spring. Staff.

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. Fall. 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. Spring. Soloway.

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. Spring. Newbury.

141 HISTORY OF INTERNATIONAL RELATIONS, 1870-1919 (PWAD 140) (3). Examines the interaction of the European alliances, the impact of imperialism on international politics, the outbreak of World War I, and the diplomacy and peacemaking of that war. Fall. (Alternate years.) Staff.

142 HISTORY OF INTERNATIONAL RELATIONS, 1919 TO PRESENT (PWAD 142) (3). A study of the "new diplomacy," totalitarian foreign policy in the 1930s, the diplomacy of World War II, the Cold War, and the re-emergence of the multipolar balance of power. Spring. (Alternate years.) Staff.

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. Spring. Griffiths.

144 THE HISTORY OF THE SECOND WORLD WAR (PWAD 145) (3). Origins, course, and effects of World War II, including all theaters, the impact at home, the Holocaust, the role of intelligence, and new technologies like radar, jets, and atomic bombs. Spring. Weinberg.

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. Fall. Nelson, Higginbotham.

146 REVOLUTION AND NATION-MAKING IN AMERICA, 1763-1815 (PWAD 146) (3). Major topics: constitutional conflict in the British empire; independence and war; Confederation and Constitution; growth of political parties and nationalism in a period of domestic change and international conflict. Spring. Higginbotham, Nelson.

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." Fall. Watson.

148 CIVIL WAR AND RECONSTRUCTION, 1848-1877 (PWAD 148) (3). Focus is on the causes, nature, and consequences of the Civil War. Spring. Barney.

149 U.S. GILDED AGE/PROGRESSIVE ERA, 1877-1920 (3). Examining United States history around the turn of the century, this course concentrates on the themes of the "price of progress." America's rise as an industrial and world power is set off against intense political and cultural conflict. Spring. Fink.

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. Fall and spring. Filene, Leuchtenburg.

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. Spring. 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. Fall. 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. Fall. Capper.

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. Spring. Capper.

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. Fall or spring. (Alternate years.) Kasen.

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. Fall. Semonche.
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 to Supreme Court members. Spring. Semonec.

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, the role of religious movements. Spring. Mathews.

160 WOMEN AND RELIGION IN U.S. HISTORY (WMST 160) (3). Prerequisites are introductory courses in religious or women's studies or United States history. An interdisciplinary consideration of women's roles, behavior, and ideas in the religious life of Americans from 1626 to 1982. Spring. 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 depersonalization. Fall or spring. (Alternate years.) Kasson.


163 THE OLD SOUTH (3). Economic, cultural, and social history of the ante bellum South. The region's political history serves as a supporting part of the study. Spring. 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. Fall. Staff.

165 HISTORY OF AFRO-AMERICANS TO 1865 (3). Survey of Afro-American history from origins to abolition of slavery. Examination of role of Blacks in United States history to 1865. Focus on unique subculture of Afro-Americans. Fall. Staff.

166 HISTORY OF AFRO-AMERICANS, 1865 TO PRESENT (3). Examination of role of Blacks in United States history after 1865. Focus on Black subculture. Analysis of theories about the Black experience in America. Spring. Staff.

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. It describes southern white culture as the result of the black presence. Fall and spring. 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. Spring. Hall.

169 AFRICAN AMERICAN WOMEN'S HISTORY (WMST 169, AFAM 169) (3). This course covers the history of black women in the United States history from the eighteenth century to the present. It deals with such themes as work, family, community, sexuality, politics, religion, and culture. Spring. Staff.

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. Fall. 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 interact. History 21 or 22 or Religious Studies 29 recommended. Fall. 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. Spring. Wallor.

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. Fall or spring. Hall, Pollock.

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. Fall, spring, 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 between 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. Fall or spring. (Alternate years.) Chasteen.

178 THE DEVELOPMENT OF LATIN AMERICAN SOCIETY (3). Prerequisite, some contact with Latin America through courses or personal experience. Selected aspects of Latin American social history, such as race relations, land tenure, labor systems, violence, and social upheaval. Spring. (Alternate years.) Chasteen.

180 SLAVERY IN THE NEW WORLD (3). A comparative approach to the institution of slavery in North America, Latin America, and the Caribbean. Fall. Staff.

181 INTELLECTUAL HISTORY OF BLACKS IN THE AMERICAS (3). Examines black writers in the Americas since 1829, especially in North America and the Caribbean. Emphasizes the ideas of such individuals as Dubois, Garvey, Fanon, James, Guillen, Rodney, and Cesaire. Spring. Staff.

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. Spring. (Alternate years.) 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. Spring. Brooks.

186A REVOLUTION IN RUSSIA, 1900-1930 (3). A close study of Russia's age of revolution from the reign of the last tsar to the turbulent Stalin Revolution of 1929, with emphasis on the revolutions of 1917. Fall. Raleigh.


187 INTELLECTUAL HISTORY OF IMPERIAL RUSSIA (3). Interpretative lectures examine the most significant ideas and personalities and major social trends in modern Russia, emphasizing the decline of serfdom, growth of capitalism (and Marxism), and the impact of the West on Russia. Fall. Brooks.
188 THE RISE AND FALL OF THE HAPSBURG EMPIRE, 1526-1918 (3). A study of the development of this multinational empire, its special role in the fortunes of Central Europe, and its demise under the impact of modern nationalism and great power conflicts. On demand. Staff.

190 EASTERN EUROPE SINCE WWII (3). An examination of the countries of Eastern Europe, their origins and development since World War II, their cohesion and conflict. Spring. Jollick.

193 RESISTANCE MOVEMENTS AND NATIONALISM IN AFRICA (3). An attempt to define the features of various movements in Africa during the nineteenth and twentieth centuries that sought to resist foreign domination in the cultural and political spheres. Spring. Newbury.

194A AFRICAN PEASANTS IN HISTORICAL PERSPECTIVE (3). Through case studies and readings on theory, this course considers the factors of change in peasant societies in Africa: ecology, agrarian traditions, gender relations, colonial policy, capitalism, and peasant initiatives. Spring. Newbury.

194B CHRISTIANITY IN AFRICA: PRIESTS, PASTORS, AND PREACHERS (3). This course analyzes the historical impact of missions on African societies, the redefinition of missionary practices by African Christians, and the development and varieties of Independent Christian churches in Africa. Fall. Newbury.

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. Spring. 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. (Alternate years.) Shields.

197 TRADITIONAL CHINA (ASIA 197) (3). Examines imperial China, emphasizing socioeconomic and cultural institutions and developments. While various periods are discussed, course focuses mainly on the Qing dynasty (1644-1911). Spring. Kessler.

Courses for Graduates

200 GRADUATE STUDIES IN HISTORY: FIRST COURSE (3). Introduction to research. Required for all first-year students; sections for American and non-American concentrators. Fall. Staff.

203 COLLOQUIUM ON MODERN EUROPE (3). Directed readings on European history, from Britain through European Russia, from early modern times to the present. Required for students entering in European history who do not take History 205. Both semesters. Staff.

204 READINGS IN RUSSIAN AND EAST EUROPEAN HISTORY (3). A sequence of four courses on the several periods and the main themes of Russian and Soviet History. Fall or spring. Brooks, Griffiths, Jollick, Raleigh.

204A READINGS IN RUSSIAN HISTORY BEFORE 1796 (3).

204B READINGS IN RUSSIAN HISTORY, 1796-1917 (3).

204C READINGS IN SOVIET HISTORY (3).

204D SPECIAL TOPICS IN RUSSIAN AND SOVIET HISTORY (3).

206 PROBLEMS IN CREEK HISTORY, 600-323 B.C. (3). Prerequisite, consent of the instructor. (Alternate years.) Spring. McCoy.

207 COLLOQUIUM IN LATIN-AMERICAN HISTORY (3). Directed readings on Latin-American history from preconquest to the present; required for students entering in that field. Fall or spring. Chaseen.


209 INTRODUCTORY COLLOQUIUM IN UNITED STATES HISTORY (3). Directed readings on American History; required for students entering in that field. Both semesters. Staff.

210 READINGS IN EAST EUROPEAN HISTORY (3). Directed readings on modern Eastern European history. (Alternate years.) Spring. Jollick.


217 READINGS IN URBAN HISTORY (3). Spring. (Alternate years.) Lotchin.

219 EUROPE IN THE SIXTEENTH CENTURY (3). Spring. (Alternate years.) Headley.

220 READINGS IN MODERN EUROPEAN WOMEN'S HISTORY (WMST 220) (3). A readings course in the history of Women in Europe since 1500. Fall. Bennett, Harris.

221 READINGS IN AMERICAN WOMEN'S HISTORY (WMST 221) (3). A readings course on the history of women in the United States. Fall. Hall, Hoffert.

222 SELECTED TOPICS IN THE COMPARATIVE HISTORY OF WOMEN (WMST 222) (3). Prerequisite, History 220 or 221 recommended. Directed readings on selected topics on the history of women in Western Europe and the United States. Spring. Bennett, Hall, Harris.

223 READINGS IN MEDIEVAL WOMEN'S HISTORY (3) (WMST 223). A readings course on the history of women in Medieval Europe. Spring. Bennett.

224 FRANCE, THE GERMAN EMPIRE, AND THE PAPACY IN THE HIGH MIDDLE AGES (3). Prerequisite, reading knowledge of French or German. Fall. (Alternate years, on demand.)

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. Fall. Kohn.


227 READINGS IN EARLY MODERN EUROPEAN HISTORY (3). Fall. 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. Fall. J. Bennett.

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. Spring. McVaugh.

230 EARLY MODERN GERMANY (3). A topical survey of the political, social, and economic history of early modern Germany. Fall. McIntosh.

231 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. Headley.

232 TOPICS IN THE HISTORY OF MODERN FRANCE, 1500-PRESENT (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. Fall. Kramer, Reid, Smith.

234 READINGS IN NINETEENTH-CENTURY EUROPEAN HISTORY (3). Fall. Jarausch.

235 READINGS IN EUROPEAN SOCIAL HISTORY (3). Spring. (Alternate years.) Reid.

236 EUROPE BETWEEN THE TWO WORLD WARS (3). Fall. (Alternate years.) Weinberg.

238 POLITICAL AND INTELLECTUAL HISTORY OF ENGLAND UNDER THE TUDORS AND THE STUARTS (3). Prerequisite, History 138. Fall or spring. (Alternate years.) Harris.

239 MEDIEVAL ENGLAND (3). Prerequisite, History 137 or equivalent. Fall. (Alternate years.) Pfaff.

240 STUDIES IN MODERN ENGLISH HISTORY (3). Directed readings in nineteenth- and twentieth-century English history. Topics vary from year to year. Fall or spring. (Alternate years.) Soloway.

241 STUDIES IN TWENTIETH-CENTURY ENGLAND (3). Directed readings in twentieth-century English history. Topics vary from year to year. Fall or spring. (Alternate years.) Soloway.

243 LATE MEDIEVAL ENGLAND (3). Prerequisite, HIST 133, 134, or equivalent. Readings in English history, ca. 1300-1500, with a focus on social, economic, political, and legal topics. Spring. J. Bennet.

244 HISTORY OF U.S. FOREIGN RELATIONS (3). Spring. (Alternate years.) Hunt.

245 HISTORY AND THE SOCIAL SCIENCES (3). The relationship of the social sciences to history, logic of inquiry, use of quantitative methods, introduction to the computer. Fall or spring. Jarausch.

246 TOPICS IN AMERICAN INTELLECTUAL HISTORY (3). Readings and discussions on selected topics in the history of American thought and intellectual history. Fall or spring. (Alternate years.) Capper.

249 READINGS IN EARLY AMERICAN HISTORY (3). Fall or spring. (Alternate years.) Nelson.

250 THE AMERICAN REVOLUTIONARY ERA, 1763-1789 (3). Spring. (Alternate years.) Higginbotham.

251 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. Spring. (Alternate years.) Higginbotham.

252 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. Fall. (Alternate years.) Barney.


255 RECENT AND CONTEMPORARY UNITED STATES (3). Fall or spring. Leuchtenburg.

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. Spring. Leuchtenburg.

260 PUBLIC HISTORY (3). An introduction to the various aspects of "public" (or "applied") history: cultural resources management, community and institutional history, and history in public and private policymaking. Spring. Staff.

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. Kohn.

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. Spring. Kohn.

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. Fall. 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. Fall. Leland.

265 READINGS IN AFRO-AMERICAN HISTORY (3). Graduate students compile bibliographies and read important contributions to various aspects of Afro-American history, stressing shifts in Afro-American historiography and including very recent works. Fall. Staff.

266 OCCUPATIONAL HISTORY AND FOLKLORE (FOLK 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.

267 READINGS IN U.S. LABOR HISTORY (3). Readings, reports, and discussion of selected themes in American labor history including class formation; occupational culture; gender, race, ethnic influence; labor and state policy; and labor politics. Spring. Fink.

268 COMPARATIVE LABOR HISTORY (3). Course examines labor in the nineteenth and twentieth centuries from a comparative perspective. Depending on instructor's expertise, two of the following are paired: American, European, and Latin American labor. Spring. Fink.

269 TOPICS IN AMERICAN CULTURAL HISTORY (3). Fall. (Alternate years.) Kasson.

270 PROBLEMS IN LATIN AMERICAN HISTORY (3). Spring, fall. (On demand.) Chasteen.

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. Fall, spring. Allen.

290 TOPICS IN HISTORY FOR GRADUATES (3). Fall or spring. Staff.

292 METHODS OF COURSE DESIGN (3). The seminar enables graduate students to design an undergraduate course. Via pedagogical readings, historical research, and intensive discussions, students develop a syllabus plus several lesson plans and lectures. Filene.

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 physically resident in Chapel Hill. Fall or spring. Staff.

300 GRADUATE STUDIES IN HISTORY: SECOND COURSE (3). Application of research skills to historical investigation. Required for all first-year students; sections for American and non-American concentrators. Spring. Staff.

301 ANCIENT HISTORY (3). Conference and reports. Spring. McCoy.
311 MEDIEVAL HISTORY (3). (A reading knowledge of Latin is required.) Conference and reports. Fall. (Alternate years, on demand.) Behrends.

312 MEDIEVAL ENGLAND: SEMINAR (3). Prerequisite, previous work in English medieval history and some knowledge of Latin. Spring. (Alternate years.) Pfiff.

318 EUROPEAN INTELLECTUAL HISTORY (3). The study of beliefs and values in modern European societies. (Alternate years.) Kramer.

319 EARLY MODERN EUROPEAN HISTORY (3). Conference and reports. Fall. (Alternate years.) Headley.

321 RECENT EUROPEAN HISTORY (3). Conference and reports. Spring. (Alternate years.) Weinberg.

322 TUDOR-STUART ENGLAND (3). Conference and reports. Fall or spring. (Alternate years.) Harris.

323 SEMINAR: MODERN ENGLAND (3). (On demand.) Soloway.


325 SEMINAR IN MODERN RUSSIAN HISTORY (3). Conference and reports. Fall. Griffiths.

326 SEMINAR IN SLAVIC HISTORY (3). Spring. Jolluck.

327 SEMINAR IN INTERNATIONAL RELATIONS SINCE 1848 (3). An investigation of European and international politics/relations since 1848. A reading knowledge of French or German is desirable. Fall. (Alternate years.) Staff.

330 THE AMERICAN REVOLUTION, 1763-1789 (3). Fall. Higginbotham.

333 THE NATIONAL PERIOD, 1815-1860 (3). Spring. (Alternate years.) J. Williamson.

334 SEMINAR IN NINETEENTH- AND TWENTIETH-CENTURY AMERICAN URBAN HISTORY (3). Spring. (Alternate years.) Lotchick.

335 RECENT HISTORY OF THE UNITED STATES (3). Fall. Leuchtenburg.

336 CIVIL WAR AND RECONSTRUCTION (3). Conference and reports. Spring. Staff.

338 THE SOUTH SINCE RECONSTRUCTION (3). Spring. Leoudis.

339 SEMINAR IN AMERICAN INTELLECTUAL AND CULTURAL HISTORY (3). Research seminar in the history of American thought and intellectual culture. Fall or spring. (Alternate years.) Capper.

340 SEMINAR IN AMERICAN CONSTITUTIONAL HISTORY (3). On demand. Semoneche.


342 SEMINAR IN AFRO-AMERICAN HISTORY (3). Graduate students already well read in Afro-American history write original research papers in the field. Spring. Staff.

344 SEMINAR IN THE HISTORY OF U.S. FOREIGN RELATIONS (3). Fall or spring. (Alternate years.) Hunt.

350 SEMINAR IN THE HISTORY OF SCIENCE (3). (On demand.) McVaugh.

361A INTRODUCTION TO RESEARCH IN MILITARY HISTORY (3). Introduction to the issues, methods, and sources for research military history; includes research and writing. Spring. Kohn.

361B ADVANCED RESEARCH IN MILITARY HISTORY (3). Advanced research in military history; includes preparation of an article-length paper for publication or a thesis chapter, and critique of seminar papers of participants. Fall. Kohn.

371 SEMINAR IN LATIN AMERICAN HISTORY (3). Fall or spring. Chasteen.

387 RESEARCH SEMINAR ON WOMEN'S HISTORY (WMST 387) (3). A research seminar on the history of women in Western Europe and the United States. Spring. Hall, Bennett, Harris, Hoffert.

390 SEMINAR IN HISTORY (3). Given on demand and as resources permit, in fields which lack another regularly scheduled seminar offering. Fall and spring. Staff.

391 M.A. RESEARCH SEMINAR (3). Preparation of the M.A. thesis, including a manuscript draft based on original research in primary sources. Fall. Members of the graduate faculty.


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.

398 DISSERTATION WORKSHOP (3). Spring. Leuchtenburg.

399 HISTORICAL EXPLANATION AND RESEARCH DESIGN (3). A dissertation practicum, discussing problems of historical explanation in conjunction with a student's choice and articulation of a dissertation topic. Required of all doctoral candidates in the last semester of course work. Spring. Staff.

SCHOOL OF INFORMATION AND LIBRARY SCIENCE

BARBARA B. MORAN, Dean
Helen R. Tibbo, Associate Dean

Professors
Evelyn H. Daniel (36) Information Resources Management, Organization Theory, Special Librarianship, School Librarianship
Joe A. Hewitt (21) Administration of Technical Services, Academic Librarianship
Gary J. Marchionini (89) Microcomputer Applications in Education and Information Processing, Research Methods and Statistics, Human-Computer Communication, Information-Seeking in Electronic Environments
Barbara B. Moran (30) Academic Librarianship, Management of Information Agencies, Human Resources Management, Popular Materials, Research Methods

Associate Professors
Stephanie W. Haas (46) Natural Language Processing, Information Retrieval, Artificial Intelligence
Robert M. Losee (40) Information Retrieval, Information, Reasoning Systems, Decision Making
Jerry D. Saye (37) Organization of Materials, History of Books and Libraries, Cataloging and Classification, Technical Services, Abstracting and Indexing
Helen R. Tibbo (47) Archives and Records Management, Information Services, Electronic Information Retrieval
Barbara M. Wildemuth (45) Information-Seeking Behaviors and Information Use, Design and Evaluation of Information Systems, Adoption and Use of Information Systems, Adoption and Use of Information Technologies

Assistant Professors
Claudia J. Gollop (69) Reference Services, Information Resources, Collection Development, Health Sciences Librarianship
Paul Solomon (52) Role of Information in People's Lives, Information Systems in Learning Organizations, Methods of User-Based Analysis in Support of Information Systems Design
Brian W. Sturm (87) Storytelling, Children's and Young Adult Librarianship, Children's and Young Adult Literature, Communication and Consciousness, Folklore
Charles L. Viles (85) Distributed Information Retrieval, Distributed Object Systems, Internet Resource Discovery, Undergraduate Education

Lecturers
Scott F. Barker, Director of Computing and Networking Services
Melissa M. Cain, Director of External Relations
Janice L. Daquila-Pardo, Director of Communications and Public Relations

Adjunct Professors
Laura N. Gasaway (34) Law Librarianship
Ida M. Reed (41) Music Librarianship
Diane C. Strauss (35) Business Information Sources

Adjunct Associate Professor
Charles B. McNamara (42) Rare Book Librarianship

Distinguished Research Professor
Frederick Kilgour (48) Use of “Known-Item” Books for Information Retrieval

Professors Emeriti
Robert J. Brodchis
Raymond L. Carpenter
Mildred H. Downing
James F. Gowan
Edward C. Holley
Mary E. Kingsbury
Gertrude London
Haynes McMullen
Mary W. Oliver
Jerold Orne

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 technology and new applications relating to the delivery of information to users; 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 track students may elect to concentrate in one of four areas: information retrieval, database management, systems analysis and design, or computer networking and systems administration.

The MSLIS 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. This degree is intended to prepare students for careers in library service in areas such as library administration, archives and documents librarianship, cataloging, public and reference services, acquisitions and collections management, children's librarianship, access and manipulation of database information, special collections, and subject areas. Graduates of the program are prepared to practice within various settings: academic, public or special libraries, information centers, or school library media centers.

Students must possess a competency in basic computing skills using a variety of software applications, which can be satisfied by either providing evidence of proficiency or completing the Introduction to Computing course (INLS 50, which does not count toward the forty-eight credits required for the graduate degree). Each master's student is required to complete one course in each of the curriculum's five functional areas: organization, collection/retrieval, communication, design/evaluation, and management. The remainder of the forty-eight credit hours of course work is then selected, in consultation with the student's faculty adviser, 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 thesis is also required of each master's student.

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 evidence a balanced distribution of courses in the sciences, social sciences, and humanities; quantitative training is becoming increasingly important. 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 curriculum provisions for the master's programs, see the Record of the School of Information and Library Science.

The CAS 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. 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.

The school occupies three floors of Manning Hall. Located there are the administrative and faculty offices, classrooms, SunSITE (one of the most popular Web sites on the Internet), and the Information and Technology Resource Center (ITRC). The ITRC includes the 70,000 volume Information and Library Science Library and a departmental computer lab. The computer lab includes a 32-seat classroom with Pentium II 266Mhz PCs (17-inch monitor, 64MB RAM, 6GB disk, 24X CD and sound, ZIP drive, video camera, video capture and page scanner on each machine) and a 22-seat general purpose area with Pentium 100-based PCs. Also in the computer lab are two dual processor Sun Ultra II Unix workstations, a dual processor Pentium Pro-based NT file server, a 14-drive CD-ROM server tower, and assorted peripherals such as laser printers and digital cameras. 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 connection. The school's network is connected to the UNC campus backbone over a 100MB 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 production, graphics and image manipulation, database management, statistical analysis, word processing, multimedia development, software development, and CD-ROM searching.

Those interested in any SILS degree programs should see the school's Web page at www.ils.unc.edu, or request information from the School of Information and Library Science, CB #3360, 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

INTRODUCTION TO COMPUTING (3). Study of the functional capabilities of major classes of microcomputer application software, the computing needs of information agencies, and selected current topics in computing. Staff.

INFORMATION SYSTEMS ANALYSIS AND DESIGN (3). Prerequisite: INLS 50. Analysis of organizational problems and how information systems can be designed to solve those problems. Application of database and interface design principles to the implementation of information systems. Wildemuth.

ORGANIZING AND RETRIEVING INFORMATION (3). Prerequisite, INLS 50. Methods for organizing and retrieving information, including using existing databases and the construction of a database using a database management software package. Viles, Wildemuth.

DATA COMMUNICATION (3). Prerequisite, INLS 50. Examines the functions of data communication networks such as the Internet for communication, accessing remote resources, and information searching and retrieval. Explores emerging multimedia applications and their potential uses. Dempsey, Newby, Viles.

INDEPENDENT STUDY IN INFORMATION SYSTEMS (1-3). Study by an individual student on a special topic under the direction of a specific faculty member. A prospectus/plan for the work is required in advance of registration. Staff.

HISTORY OF BOOKS AND LIBRARIES (3). The history of human communication focusing on the origin and development of the book and the origin and development of libraries and librarianship. Sayre.

SELECTED TOPICS (3). Exploration of an introductory-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:

INTRODUCTION TO HYPERMEDIA (3). Christensen.

INTRODUCTION TO COMMUNICATION NETWORKS (3). Dempsey.

INFORMATION SYSTEMS ANALYSIS AND DESIGN (3). Barreau. (Now INLS 60)

ORGANIZING AND RETRIEVING INFORMATION (3). Mangrum. (Now INLS 70)

INFORMATION RESOURCES AND SERVICES I (3). Analysis, use, and evaluation of information and reference systems, services, and tools with attention to both printed and electronic modes of delivery. Provides a foundation in search techniques for electronic information retrieval, question negotiation, and interviewing. Gollop, Tibbo.

NATURAL LANGUAGE PROCESSING (3). Prerequisite, Computer Science 171. Statistical, syntactic, and semantic models of natural language. Tools and techniques needed to implement language analysis and generation processes on the computer. Haas.

HISTORY OF CHILDREN'S LITERATURE (3). A survey of children's literature in English from the Middle Ages through the nineteenth century. Staff.

YOUNG ADULT LITERATURE AND RELATED MATERIALS (3). A survey of print and nonprint library materials particularly suited to the needs of adolescents. Staff.

CHILDREN'S LITERATURE AND RELATED MATERIALS (3). Survey of literature and related materials for children, with emphasis on twentieth-century authors and illustrators. Staff.

MANAGEMENT OF INFORMATION AGENCIES (3). An introduction 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.

ORGANIZATION OF INFORMATION (3). Introduction to the problems and methods of organizing information, including information structures, knowledge schemas, data structures, terminological control, index language functions, and implications for searching. Solomon.

ORGANIZATION OF MATERIALS I (3). Prerequisite or corequisite, INLS 50. An introduction to the problems of organizing information and collections of materials. Formal systems for cataloging and classifying are studied. Sayre.
153 RESOURCE SELECTION AND EVALUATION (3). Identification, provision, and evaluation of resources to meet primary needs of clientele in different institutional environments. Staff.

161 NON-NUMERIC PROGRAMMING FOR INFORMATION SYSTEMS APPLICATIONS (3). An introduction to computer programming for library operations and information retrieval applications. Losee.

162 SYSTEMS ANALYSIS (3). Introduction to the systems approach to the design and development of information systems. Methods and tools for the analysis and modeling of system functionality (e.g., structured analysis) and data represented in the system (e.g., object-oriented analysis) are studied. Haas, Sonnenwald, Wildemuth.

165 RECORDS MANAGEMENT (3). Introduces the principles of records center design, records analysis and appraisal, 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 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). Prerequisite, INLS 50, Computer Science 14 or Computer Science 15. 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, Viles.


176 INFORMATION MODELS (3). An introduction to models and modeling techniques used in information science and their application to problems and issues in the field. Haas.

180 COMMUNICATION PROCESSES (3). Examines the social and technological processes associated with the transfer of information and includes discussions of formal and interpersonal communication channels. Daniel, Sonnenwald, Wildemuth.

181 INTERNET APPLICATIONS (3). Prerequisite, INLS 50. 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. Barker, Collins, Dempsey, Rhine.

182 INTRODUCTION TO LOCAL AREA NETWORKS (3). Prerequisite, INLS 50. Introduction to local area network hardware, topologies, operating systems, and applications. Also discusses LAN management and the role of the network administrator. Rankin.

184 PROTOCOLS AND NETWORK MANAGEMENT (3). Prerequisite, 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. Gogan.

186 TCP/IP NETWORKING AND NETWORK PROGRAMMING (Computer Science 143) (3). Prerequisites, (INLS 161, 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.

Courses for Graduates

201 RESEARCH METHODS (3). Prerequisite, completion of twelve semester hours. An introduction to research methods used in library and information science. Includes the writing of a research proposal. Losee, Solomon.

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 are considered. Wildemuth.

204 INTERNATIONAL AND COMPARATIVE LIBRARIANSHIP (3). The concepts of the library's role in other countries; trends in international cooperation; American participation in international library-related organizations and programs. Staff.

210 INTERMEDIATE SELECTED TOPICS (3). Exploration of an intermediate-level special topic not otherwise covered in the curriculum. Previous offerings of these courses do not predict their future availability; new courses may replace these. Courses offered during 1997-1998 include:

210-39 CULTURAL STUDIES OF COMMUNICATION. Chatman.

210-40 VALUE OF INFORMATION. Losee.

210-69 LIBRARY SERVICES TO SPECIAL POPULATIONS. Gollop.

210-76 MULTIMEDIA APPLICATIONS FOR THE INTERNET: DESIGN AND IMPLEMENTATION ISSUES. Dempsey.

211 INFORMATION RESOURCES AND SERVICES II (3). Prerequisite, INLS 111. Further explores information and reference systems, services, and tools with a focus on databases. Investigates effective information retrieval techniques, end-user instruction, and the management of electronic information services. Gollop, Tibbo.

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, task, and other situational perspectives are taken. Solomon.

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. Detch.

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. Staff.

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 on-line databases. Gollop.

226 SERIALS (3). Prerequisites, INLS 111 and INLS 151. Survey of technical and public services aspects of library serials management, including organization, collection development, acquisition, cataloging, access, and preservation. Covers serials publishing and the role of the subscription agent. Tuttle.

227 BUSINESS INFORMATION (3). Prerequisite, INLS 111. Combines an introduction to 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. Staff.

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. Gasaway.

232 LIBRARY EFFECTIVENESS (3). Application of systematic analytical methods to the problems of management and organization. Emphasis on the use of selected techniques in designing solutions to problems in library and information service. Staff.

233 MANAGING IN 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. Varvaro.

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.

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.

239 STRATEGIC PLANNING (3). Prerequisite, INLS 131 recommended. Emphasizes the role of information in organizational planning processes. Topics include strategy development, goal formation, long-range planning, environmental scanning, and the use of information systems/products for competitive advantage. Daniel.

241 THE SCHOOL LIBRARY MEDIA CENTER (3). Philosophy and mission of the school library media center in context of the educational environment. Considers program planning and evaluation, policy development, and examination of current issues. Daniel.


243 SERVICES TO 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. Staff.

244 ADMINISTRATION OF ARCHIVES AND MANUSCRIPT COLLECTION (3). The history, principles, and techniques of acquiring and administering public and private archives and manuscript collections. Instruction is supplemented by special lectures and tours of nearby record repositories. 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. Reed.

247 SPECIAL LIBRARIES AND INFORMATION BROKERING (3). Characteristics of special libraries with emphasis on planning services to fit client needs, entrepreneurial activities, examination of public and private settings, and problems and issues surrounding the provision of specialized information services. Daniel.

251 ORGANIZATION OF MATERIALS II (3). Prerequisite, INLS 151 and pre- or corequisite, INLS 50. Examination of principles, practices, and future trends in the control and organization of materials. Instruction covers classification, subject indexing, and the cataloging of print and nonprint materials and on-line cataloging systems. Saye.

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. Greene.

256 DATABASE SYSTEMS (3). Prerequisites, INLS 50 and INLS 162. A study of the relational database model including entity-relationship theory, design, normalization techniques, and query language. Haas, Smith.

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.

263 KNOWLEDGE-BASED SYSTEMS (3). Prerequisite, INLS 150. Design of systems offering a knowledge-base in support of task requirements or that model expertise. Knowledge acquisition and representation approaches are applied in the systems development process. Haas, Solomon.

265 ABSTRACTING AND INDEXING (3). Prerequisite, INLS 50. Presents the basic principles of subject analysis through the development and analysis of abstracts, indexes, and classification systems. Both natural language and controlled vocabulary indexing is covered. Saye, Solomon.

272 ARTIFICIAL INTELLIGENCE FOR INFORMATION RETRIEVAL (3). Prerequisite, INLS/COMP 172. Logical and neural artificial intelligence models of documents, queries, and their relationship to document retrieval. Losee.

DISTRIBUTED SYSTEMS AND ADMINISTRATION (3). Prerequisites, INLS 50 or equivalent and (INLS 174 or INLS 182). Distributed and client/server-based computing. Includes operating system basics, security concerns, and issues and trends in network administration. Staff.

299 SUPERVISED FIELD EXPERIENCE (3). Prerequisite, completion of twenty-four semester hours and permission of adviser. 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. Daquila-Pardo.

300 STUDY IN INFORMATION AND LIBRARY SCIENCE (1-3). Prerequisite, permission of the instructor. Study by an individual student on a special topic under the direction of a specific faculty member. Members of the 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. Chatman.
308 **SEMINAR IN TEACHING AND ACADEMIC LIFE (3).** Prerequisite, doctoral student status. Examines teaching, research, publication, and service responsibilities. Provides perspective on professional graduate education and LIS educational programs. Explores changing curricula and discusses ethics, rewards, and problems of academic life. Daniel.

309 **SEMINAR IN TEACHING PRACTICE (1).** Prerequisite, doctoral student status. Pre- or corequisite, INLS 308. For doctoral students currently involved in teaching activities, regular seminar meetings to discuss relevant literature and aspects of the teaching experience. Members of the graduate faculty.

310 **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 1997-1998 include:

310-76 **SEMINAR IN INTERNET POLICY AND FUTURE INITIATIVES.** Jones.

311 **SEMINAR IN INFORMATION SERVICES (3).** Prerequisites, INLS 111 and pre- or corequisite, INLS 211. Administrative and professional issues in the provision of reference and information services; includes policy development implementation, facilitation of communication, ethics, integration and implementation of information technologies, and management and evaluation of information services. Tibbo.

315 **SEMINAR IN INFORMATION POLICY IN THE PUBLIC SECTOR (3).** Prerequisite, permission of the instructor. Examination of client-centered services in libraries and information agencies. Includes: information as a commodity, public policy issues, and providers of information services. Staff.

320 **SEMINAR IN CHILDREN’S LITERATURE (3).** Prerequisite, INLS 123. Advanced study of a selected topic relating to literature for children. Staff.

326 **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, permission of the instructor. Selected topics in public library services, systems, networks, and their management. Current issues are emphasized, along with the interests of the participants. Gollop.

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 service. 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.

351 **ADMINISTRATION OF TECHNICAL SERVICES (3).** Advanced study of the role and organization of technical services. Emphasis on management of acquisitions, serials and cataloging departments, coordination of technical services, and the impact of automation and networking. Saye.

352 **SEMINAR IN THE ORGANIZATION OF INFORMATION (3).** Prerequisite, INLS 151. Advanced study in the approaches used to organize information in libraries and information centers. Emphasizes both alphabetical and notational systems of subject indication. Saye.

356 **SYSTEMS IMPLEMENTATION (3).** Prerequisites, INLS 162, and INLS 256 or INLS 257. Development and implementation of an information system by an individual student or team of students. The final phases of the systems development life cycles are discussed by the class. Staff.

362 **SYSTEMS THEORY (3).** Prerequisite, INLS 162 or doctoral student status. Applications of general systems theory in various arenas, such as biological systems, complex organizations, and advanced systems analysis and design techniques and tools. Daniel.

372 **SEMINAR IN INFORMATION RETRIEVAL (3).** Prerequisites, INLS 172 and doctoral student status. A 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. Losee.

379 **RESEARCH IN INFORMATION RETRIEVAL (1-6, repeatable).** Prerequisite, INLS 372 and 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. A 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).** Prerequisites, INLS 382 and 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.

393 **MASTER’S PAPER (0-3).** Required of all master’s students. Staff.

394 **DOCTORAL DISSERTATION (3 or more).** Staff.

399 **RESEARCH IN INFORMATION AND LIBRARY SCIENCE (1-6, repeatable).** Prerequisites, doctoral status and 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.

400 **GENERAL REGISTRATION (0).**

**INTERDISCIPLINARY BIOMEDICAL SCIENCES (IBMS) PROGRAM**

**FRANK C. CHURCH, Director**

**Professors**

William Arendshorst, Cell and Integrative Biology of Vascular and Nephron Function, Interactions of Endothelial Vascular Smooth Muscle and Tubular Epithelial Cells in Hypertension

Steven Buchner, Molecular Biology of Viruses

Andrew Blight, Mechanisms of Spinal Injury and Recovery

Kerry S. Bloom, Structural Organization and Eukaryotic Chromosomes, Chromosome and Spindle Dynamics

Walter Bollinger, Neuronotnology, Developmental Neurobiology

Kenneth Bost, Molecular Genetics of Bacillus

David Brenner, Regulation of Gene Transcription

Keith W. T. Burridge, Adhesion-Mediated Cell Signaling, Tyrosine Phosphatases, Focal Adhesions
Ken McCarthy, Neuronal-Glial Cell Interactions and Differentiation, Role of Astrocytes in Brain Function
Lee McIlwain, Chemistry of Spinal Motoneurons
Gerhard Meissner, Release of the Intracellular CA2+ Ion Channels, Signal Transduction
Beverly Mitchell, Molecular Basis of Chemotherapeutic Specificity, Gene Expression, Leukemogenesis
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. Petes, Yeast Genetics, Chromosome Structure, Recombination, and Replication
Peter Petrus, Neurobiology, Neuroeducational Psychology, Reproductive Biology
John R. Pringle, Cell Cycle, Cytoskeleton and Cellular Morphogenesis, Genome Organization, and Yeast Genetics
Ralph S. Quatrano, Plant Gene Expression, Plant Development, and Cellular Polarity
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 Nitroreductase Metabolism
Lola Reid, Growth and Differentiation of Stem Cells
Howard Reisner, Immunogenetics of Human Plasma Proteins
Harold Roberts, Hematology
Aldo Rusiniak, Neuroanatomy; Neurophysiology; Neurocytology; Somatosensory System: Connections, Neurotransmitters, and Interneuronal Integration
Thomas W. Sadler, Tertatology, Developmental Biology, Molecular and Cellular Regulation of Neurulation in Mouse Embryos
Edward D. Salmen, Cell Biology, Cell Motility, Microtubules, Mechanisms of Mitosis and Cell Division
Anna Sancar, Molecular Biology, DNA Repair and Cancer, Structure and Function of DNA Repair Enzymes
Gene A. Scarbrough, Structure and Function of Eukaryote Plasma Membranes
Tom K. Scott, Plant Physiology, Phytomonones
Robert Sealeck, 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 Tumorigenesis, Suppression of Tumorigenesis 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 Infection, Outer Membrane Structure and Iron Utilization by Pathogenic Neisseria Gonorrhoeae and Neisseria Meningitis
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 Normalities
Kunihiro 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. Swenberg, Role of DNA Adducts, Repair and Replication in Carcinogenesis, Toxicology, and Risk Assessment
Dhiren Thakker, Drug Metabolism, Mechanisms of Drug Transport, Structure-Transport Relationships, Prodrug 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 Neurodeneration
Michael Topal, 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 IIa and IIb; Intracellular Messengers in Platelet Activation
Barr Whitelaw, 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. Wyrick, 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 Bouth, 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
Marla Cordeiro-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 Crews, 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
Rosann Farber, Human Molecular Genetics, Cancer Genetics, Simple Sequence Repeat Instability in Cancer Cells, Fragile X Mental Retardation, Neurofibriomatosis

Susan Fiscus, Clinical Retrovirology, Immune Response to Retroviral Infections, Antiviral Therapy

Patrick M. Flood, T-Cell Activation, Regulatory T-Cells, Response to HIV Infections

Howard Fried, Cell and Molecular Biology, Mechanisms of Nuclear-Cytoplasmic Transport, Mechanisms of RNA-Protein Recognition, RNA Structure/Function

James Garbutt, Neurobiology and Pharmacology 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 Methylation, Cell-Cycle Checkpoints

Brian Kay, Developmental and Molecular Biology of Oocytes and Embryos Development in Xenopus Laevis, Molecular Affinity Reagents

Hengming Ke, X-ray Crystallography, Structure and Function of Immunophenins 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 Kier, Functional Morphology of Invertebrates, Biomechanics

Ryszard Kulc, RNA Splicing, RNA-Protein Interactions, Regulation of Gene Expression, Antisense Oligonucleotides as Chemotherapeutic Agents

Steven A. Leedom, 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: Neuropharmacology, Somatosensory Pharmacology, and Autonomic Pharmacology

Gustavo P. Maroni, Molecular Genetics and Genetic Regulation in Drosophila Melanogaster

Susan Mayrlean, General Surgical and Cytopathology, Prostate Carcinogenesis

Royce L. Montgomery, Chronic Pain

A. Leslie Morrow, Molecular Neuropharmacology, Mechanisms of Receptor Gene Regulation

Robert Nicholas, Molecular Mechanisms of Antibiotic Resistance, Cell Signaling through G Protein-Coupled P2Y Purinergic Receptors

Barry Pallotta, Stochastic Properties of Single Ion Channels

Leslie Faris, Adhesion Receptors and Cell Signaling

Mitchell Picker, Behavioral Assessment of Narcotics Analgesics

Brian Popko Molecular Neurobiology, Myelin, Transgenic Mice

Katherine Prywansky, Signal Transduction Mechanisms That Control Polymorphic Leukocyte Adherence, Chemotaxis, Secretion, and Phagocytosis

Patricia J. Pukl, Molecular Mechanisms in Genetic Recombination and Meiosis in C. S. sp.

Kathleen W. Rao, Human Cytogenetics, Somatic-Cell Genetics

Westley Reeves, Molecular Immunology, Autoimmunity, Clinical Immunology

Robert Rosenberg, Ion Channel Electrophysiology, Molecular Mechanisms of Ion Channel Modulation

R. Jude 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. Searles, 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 Neurulation

John Woorley, Dermatopathology, Hepatobiology and Gastrointestinal Pathology

Assistant Professors

Robert B. Bourre, 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 Raf-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, Protein Folding, 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

Joseph Gerads, Molecular Pathology of Tumors, Prognostic Markers, Surgical Pathology

Lee Graves, Biochemistry of Growth Factor-Mediated Signal Transduction, Regulation of Protein Kinases

Tom Kawata, Bacterial Genetics, Molecular Biology of Gene Regulation and Pathogenicity in E. Coli, Molecular Basis for Haemophilus Dacrey 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 Matsushita, Molecular Neuroimmunology, Immune Function in Neurodegenerative 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

Laurie G. Smith, Genetic, Molecular, and Cellular Analysis of Maize Leaf Development
Lishan Su, Molecular Mechanisms of Immune Development, T-Cell Development and HIV-1 Pathogenesis, Hematopoietic Stem Cell (HSC)-Based Gene Therapy
Roland Tisch, Molecular Immunology, Mechanisms of T-Cell Activation and Tolerance Induction, T-Cell Medicated 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 Neuropathology and Pathophysiology
Deborah A. O'Brien, Mammalian Spermatogenesis, Expression of Tissue-Specific Gene Products During Germ Cell Differentiation, Cell-Cell Interactions
Clifford Rinehart, Molecular Biology of Aging and Immortalization, Transcription Factors and Altered Gene Expression in Hormonal Carcinogenesis and Interactions between Stromal and Epithelial Cells

Research Assistant Professors
Oleg Favorov, Scansorony 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
Beulah V. Koller, Generating Animal Models of Human Diseases
Cindy Lawler, Neuropsychology, Brain-Neural 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 advisor (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 advisor'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 BIO_MEDICAL SCIENCES (2). Prerequisite, enrollment in IBMS program. A research course for IBMS program students to carry on investigations in biomedical science. Fall, spring. Church, staff.
IBMS 302 SEMINAR IN INTERDISCIPLINARY BIO_MEDICAL 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. Church, staff.

SCHOOL OF JOURNALISM AND MASS COMMUNICATION

RICHARD R. COLE, Dean

Professors
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
Albern R. Elam (51) Broadcast Journalism; Management
Robert F. Lauterborn (34) Advertising
Thomas R. Linden (58) Medical Journalism
Philip Meyer (29) Public Opinion, Media Ethics, Newspapers
Donald L. Shaw (23) U.S. Newspaper History, Agenda Setting
Mary Alice Shaver (31) Advertising Media Management
James H. Shumaker (45) News-Editorial Journalism
Richard H. Simpson (32) Broadcast and Corporate Production
Robert L. Stevenson (25) Communication Theory and Research
Methods, International Communication
C. Sunner Stone (49) Censorship, Minorities in the Media, Ethnic Press
Ruth Walden (33) First Amendment Theory and Law, Media Law

Associate Professors
Harry Amara (39) News-Editorial Journalism
Jesse O. Anthony (38) Visual Communication
Richard J. Beckman (40) Visual Communication
George W. Cloud (41) News-Editorial Journalism
Anne M. Johnston (50) Media Effects, Women and Media, Political Communication
Raleigh Marr (43) News-Editorial Journalism
Cathy Packer (37) Mass Communication Law
Dulcie Straughan (36) Public Relations
John Sweeney (46) Advertising
Michael Williams (54) Visual Communication
Jan J. Yopp (42) News-Editorial Journalism, Public Relations
Xinshu Zhao (47) Advertising and Political Communication in the United States and China

Assistant Professors
Debashis Aikat (55) Media Technology
Patricia A. Curtin (56) Public Relations
Carol J. Fardon (57) Public Relations, Advertising
Lucia Vergas (53) International/Development Communication, Women and Media, Qualitative Methods

Adjunct Professor
Eli A. Rubenstein, Mass Media and Society, Media and Health and Violence, Theory and Methodology

Professors Emeriti
John B. Adams
Kenneth R. Byerly
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
Application packets are available from Graduate School Admissions, CB# 4010, Byrum Hall, Chapel Hill, NC 27599-4010.
- Completed forms are submitted to the Graduate School, whose admissions decisions are based largely on recommenda-
tions 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 1,000 on the verbal and quantitative sections combined, with at least 500 on the verbal section and 500 on the quantitative section.
  - Three letters of recommendation. Forms are provided in the application packet.
  - A statement of career intent, indicating how the applicant intends to use graduate education in journalism and mass communication.

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.

Applicants for fall admission who apply for University financial aid must have all materials to the Graduate School by January 1. All applicants are encouraged to meet the same deadline because the admission quota is reached soon after this date. Normally students are admitted only for the fall semester. In rare circumstances, a student may be admitted for the spring semester.

Financial Assistance
Park Fellowships are available to twelve new doctoral students and twelve incoming master's students. These fellowships provide handsome stipends, payment of tuition and fees, health insurance, and money for research as well as travel to professional and academic conferences. The stipend for doctoral students each year is $17,500, and master's students receive a $10,000 annual stipend. Doctoral student funding extends over the three years of the program, and master's student funding lasts for two years. In return for this funding, doctoral students must work as graduate assistants for the first two years of their doctoral programs, and master's students must work for the first year of their programs. These will be fifteen hour work weeks, and assignments will vary according to the interest and skill levels of the students involved. The Park Fellowships are available only to United States citizens.

The school has limited funds available for thesis or dissertation research through the Eli A. and Minnie S. Rubenstein awards. The school offers a $5,000 scholarship named after North Carolina journalist William F. Clingman for the study of ethics. The school also offers a $500 Tom Wicker Scholarship with preference for minority students in the graduate program.

In 1994, the Freedom Forum established special fellowships for persons with substantial experience in journalism to enter an accelerated doctoral program. Three of these fellowships are to enter each year. Information on this program is available from the director of graduate studies.

The Master's Program Sequences
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 research sequence gives students the background needed for
teaching or research. In both sequences, our students are taught to critically examine the role of mass communication in society, and all students are provided with a firm grounding in theory and analysis. By setting high standards for both scholarly and professional achievement, we seek to prepare our 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 course and those in the mass communication research sequence take two. 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, broadcast management, 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 study newswriting or editing.

**Requirements**

Master's students must earn at least 30 graduate-level credits (at least 100 courses numbered 100 or above) including credits for a thesis or special project. Course requirements are divided into three categories: basic competencies, core courses, and path courses. At least six courses (including the thesis or special project) must be numbered 200 or above. Two to four of the graduate-level courses may 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. For a more detailed description of course requirements for each sequence, please consult the chart at the end of this guide.

**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. Competency courses may be at any level, including undergraduate. Occasionally students may instead pass exemption exams which are traditionally given during the orientation period.

**Core Courses:** All master's students must take Mass Communication Research Methods (JOMC 201) and Mass Communication Law and Ethics (JOMC 264).

If the 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 will be allowed to retake the course. If the student again makes an L, he or she will not be allowed to continue in the program.

**Path recommendations:** All students on a news-editorial path should take at least one 100-level skills course. These include Advanced Reporting (JOMC 154), Magazine Writing and Editing (JOMC 156), Advanced Editing (JOMC 157), Advanced Photojournalism (JOMC 180), Documentary Photojournalism (JOMC 181), Publication Design and Information Graphics (JOMC 185), or Promotion Design (JOMC 186). Students who choose the articles option must have demonstrated competence in Reporting (JOMC 54) and also must take Specialized Reporting (JOMC 254).

Students on a public relations path should take Case Studies in Public Relations (JOMC 131), or demonstrate equivalent experience; either Public Relations Writing (JOMC 132),
Concepts of Marketing (JOMC 175), or another approved 100-level skills class; Theories of Mass Communication (JOMC 245); Seminar in Public Relations (JOMC 330); and either Seminar in Media Analysis (JOMC 302) or Seminar in Mass Communication Research Methods (JOMC 301), or a theory or research course outside the School.

Students on an advertising path should take either Sports Marketing (JOMC 174) or Concepts of Marketing (JOMC 175), Seminar in Social and Economic Problems in Advertising (JOMC 370), Seminar in Advertising Research (JOMC 379), a course in new technologies, and three other courses from either within or outside the School.

Other professional paths may be negotiated with the adviser, as are all paths in the mass communication sequence. Regardless of the sequence or path, each student must define a coherent and articulable theme connecting courses in the School of Journalism and Mass Communication and outside the School and 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.

**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. The articles or project requires the same effort and professionalism as the thesis. In addition to the professional product itself, the articles or project option requires an extensive review of the literature and statement of methods.

Students enroll in Master’s Thesis (JOMC 393) for three credits as they write the thesis or the professional equivalent. If additional time is needed to complete the thesis, they enroll in General Registration (JOMC 400) for zero credits. 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 or two 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.

**Ph.D. Program**

The Ph.D. in mass communication is designed to prepare students for college teaching and research careers in mass communication industries, advertising agencies, market or opinion research firms, business, 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 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 our program and faculty. For that reason, the statement of purpose that must accompany an application to Graduate School is 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), Mass Communication Law and Ethics (JOMC 264), Readings in Mass Communication History (JOMC 242), and Theories of Mass Communication (JOMC 245).

Forty-eight graduate credits (100-level and above courses), in addition to at least three dissertation credits, are required for the Ph.D. Those forty-eight hours must be arrayed 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. The research methods a student chooses to study must be appropriate to the student’s areas 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 can 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.

For admission, students must hold a master's degree from an accredited university. Admissions procedures and requirements are the same as for the M.A. program. Graduate School requirements for the doctorate are:

- At least four semesters in residence with a minimum of two semesters in continuous study at UNC-Chapel Hill. A doctorate generally cannot be earned by part-time enrollment.
- Written and oral comprehensive examinations at the end of the course work; the examinations are administered by a supervisory committee of five graduate faculty members.
- An oral defense of the dissertation proposal before the supervisory committee.
- An oral defense of the dissertation before the supervisory committee.

Courses for Graduates and Advanced Undergraduates

102 MASS COMMUNICATION 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. (On demand.) Phillips.

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. Phillips.

111 MINORITIES AND COMMUNICATION (3). An examination of racial stereotypes and minority portrayals in United States culture and communication. Emphasis is on the portrayal of Native Americans, African Americans, Hispanics, and Asian Americans in the mass media. Spring. Amana.


115 WOMEN AND MASS COMMUNICATION (Women's Studies 115) (3). An examination of women as media producers, subjects, and audiences with a focus on current practices and possibilities for change. Spring. Johnston, Vargas.

120 ELECTRONIC FIELD PRODUCTION AND EDITING (3). Prerequisites, JOMC 21, 33, 54, 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. Fall and spring. Simpson.

121 ADVANCED BROADCAST NEWS REPORTING (3). Prerequisite, JOMC 21. 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. Two lecture and two laboratory hours per week. Fall and spring. Botner, Elam.

125 CYBERCASTING AND CYBERPUBLISHING (3). Prerequisites, JOMC 50 and/or World Wide Web experience. Issues and applications in cybercasting and cyberpublishing. Class will create and publish cybercasts on the Internet while exploring the effective use of Internet technologies and current issues. Fall. Jones.

126 MULTIMEDIA WEB AND CD PRODUCTION (3). Prerequisites, JOMC 125 or advanced visual communication courses (JOMC 180, 181, 185, 186, 187) or radio-television production course. Students will study the convergence of traditional media as they apply to new communication technologies and produce multimedia Web sites and CD-ROM products that incorporate photography, videography, audio, and graphics. Beckman.

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. Fall and spring. Curtin, Pardun, Straughan.

131 CASE STUDIES IN PUBLIC RELATIONS (3). Prerequisite, JOMC 130. Analysis of public relations practices, including planning, communication, and evaluation exercises; management responsibilities. Fall. Curtin, Straughan.

132 PUBLIC RELATIONS WRITING (3). Prerequisites, JOMC 53 and 130. Education and practice in communication skills required of public relations practitioners. Fall and spring. Curtin, Straughan, Yopp.

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. Fall. Simpson.

140 CURRENT ISSUES IN MASS COMMUNICATION (3). Analysis of the interrelationships between United States mass media and the society that they serve. Fall and spring. Brown, Vargas, Walden.
141 PROFESSIONAL PROBLEMS AND ETHICS (3). Intensive study of professional and ethical issues and problems facing the mass media and their employees in relation to modern society. Spring. Meyer.


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. Fall and spring. Stone.

145 PROCESS AND EFFECTS OF MASS COMMUNICATION (3). This course presents mass communication as a social process, incorporating literature from journalism, social psychology, sociology, political science, and history. Students become acquainted with factors in message construction, dissemination, and reception by audiences. Fall. Brown, Shaw.

146 INTERNATIONAL COMMUNICATION AND COMPARATIVE JOURNALISM (Political Science 146, Communication Studies 155) (3). Development of international communication; the flow of news; the role of communication in international relations; communication in the developing nations; comparison of press systems. Spring. Stevenson, Vargas.

154 ADVANCED REPORTING (3). Prerequisites, JOMC 53 and 54. Rigorous, in-depth instruction and critiques of students' news and feature assignments that are done by various reporting methodologies: interviews, official records, direct and participant observation, and survey research (the Carolina Poll). Fall and spring. Meyer.

156 MAGAZINE WRITING AND EDITING (3). Prerequisites, JOMC 53 and 57. Instruction and practice in planning, writing, and editing copy for magazines. Fall. 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. Spring. Cloud, staff.

159 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.

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. Fall. Blanchard.

164 INTRODUCTION TO MASS COMMUNICATION LAW AND ETHICS (3). Introduction to press freedom and the First Amendment, including libel, privacy, access to information, free press/fair trial, advertising and broadcast regulation, journalistic privilege, prior restraint. Graduate students take JOMC 264. Fall and spring. Bittner, Packer, Walden.

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. Fall and spring. Bowers, Lauterborn, Shaver, 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; research in copy testing. Fall and spring. 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. Fall and spring. Bowers, Zhao.

173 ADVERTISING CAMPAIGNS (3). Prerequisites, JOMC 53 and 171 or 172. Planning and executing advertising campaigns; types and methods of advertising research; the economic function of advertising in society. Fall and spring. 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. Fall. 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 they are practiced, emphasizing the role of mass communication. Spring. 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. Fall. Sweeney.

178 RETAIL ADVERTISING (3). Prerequisites, JOMC 53, 170 or equivalent. Principles and practice of retail advertising in all media, with emphasis on sales, writing, and layout of retail advertising for the print media. Fall and spring. Bowers, Shaver.

179 ADVERTISING RESEARCH (3). Prerequisites, JOMC 53, 170 or equivalent. Detailed study and application of advertising research methods, including focus groups, copy testing, audience research, and evaluation. Fall and spring. Bowers, Zhao.

180 ADVANCED PHOTOJOURNALISM (3). Prerequisites, JOMC 80 and JOMC 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. Fall. Beckman.

181 DOCUMENTARY PHOTOJOURNALISM (3). Prerequisite, JOMC 180. Students study and produce work on the social documentary tradition of photojournalism. Spring. Beckman.

185 PUBLICATION DESIGN (3). Prerequisites, JOMC 85 and JOMC 53 (concurrently), permission of the instructor. Detailed study and application of graphic design techniques in advertising, corporate communication, magazines, newspapers, and information graphics. Conceive and execute numerous finished layouts and graphics. Fall. Williams.

186 PROMOTION DESIGN (3). Prerequisite, JOMC 85, permission of the instructor. Intensive readings, discussion, and practice in graphic design. Student selects concentration from advertising, corporate communication, magazine or newspaper design, or information graphics. Produces finished works for competitions or publication. Spring. 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. Fall. Anthony.

191 PROSEMINAR IN CONTEMPORARY MASS COMMUNICATION (3). Small classes on various aspects of journalism and mass communication with subjects and instructors varying each semester. One to three hours a week. Fall and spring. Staff.
Courses for Graduates

201 MASS COMMUNICATION RESEARCH METHODS (3). Prerequisite, permission of the instructor. 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. Fall. Stevenson, Brown, Meyer.

202 MASS COMMUNICATION PEDAGOGY (3). Investigation of college teaching and academic life, including course planning, syllabus preparation, interpersonal skills, presentational modes, evaluation, and balancing teaching with other expectations. Spring. Bowers.


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. Spring. Brown, staff.


254 SPECIALIZED REPORTING (3). Prerequisite, JOMC 54 or permission of the instructor. Reporting of complicated topics, using in-depth backgrounding, investigative reporting techniques, story conferences and documents, and other research data. Fall. Meyer.

264 MASS COMMUNICATION LAW AND ETHICS (3). Prerequisite, permission of the instructor. Intensive study of press freedom and the First Amendment, including libel, privacy, access to information, free press-fair trial, advertising and broadcast regulation, journalistic privilege, prior restraint. Fall. Walden, Packer.

301 SEMINAR IN MASS COMMUNICATION RESEARCH METHODS (3). Prerequisites, JOMC 201 or equivalent, and permission of the instructor. Advanced work in quantitative data analysis and research preparation. Spring. Stevenson, Brown.

302 SEMINAR IN MEDIA ANALYSIS (3). Prerequisite, permission of the instructor. Students participate in the design and execution of media research projects. Spring. Staff.

330 SEMINAR IN PUBLIC RELATIONS (3). Prerequisite, permission of the instructor. Readings, discussions, and research in public relations. Fall. Straughan.

340 SEMINAR IN MASS COMMUNICATION AND SOCIETY PERSPECTIVES (3). Prerequisite, permission of the instructor. Readings, discussion, and papers on the roles and responsibilities of mass communication in society. Spring. Johnston.

342 SEMINAR IN MASS COMMUNICATION HISTORY (3). Prerequisite, permission of the instructor. Readings, discussion, and projects in mass communication history. Fall. Shaw, Blanchard, Bittner.

346 SEMINAR IN INTERNATIONAL COMMUNICATION (Political Science 346) (3). Prerequisite, JOMC 146 or permission of the instructor. Fall. Stevenson.

360 SEMINAR IN DEVELOPMENT OF FIRST AMENDMENT Freedoms (3). Prerequisite, permission of the instructor. Readings and discussions about development of and interrelationships among the First Amendment freedoms of speech, press, assembly, petition, association, and religion. Fall. Blanchard.

364 SEMINAR IN MASS COMMUNICATION LAW AND ETHICS (3). Prerequisite, JOMC 264 or permission of the 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. Walden, Packer.

370 SEMINAR IN SOCIAL AND ECONOMIC PROBLEMS IN ADVERTISING (3). Prerequisite, permission of the instructor. Readings, discussion, and papers on advertising as a social and economic force in contemporary society. Spring. Bowers, Shaver.

379 SEMINAR IN ADVERTISING RESEARCH (3). Prerequisite, permission of the instructor. Readings and discussion examining theories underlying advertising and the testing of those theories through research projects. Spring. Zhao.

390 READING AND RESEARCH (3). Prerequisite, permission of the instructor. Advanced reading or research in selected field. Fall and spring. Staff.

393 MASTER'S THESIS (3). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3 or more). Fall and spring. Staff.

400 GENERAL REGISTRATION (0).

CURRICULUM IN LEISURE STUDIES AND RECREATION

KARLA A. HENDERSON, Chair

Professor
Karla A. Henderson (8) Multiculturalism, Women and Leisure, Research Methodology, Leisure Behavior

Associate Professor
M. Debonah Bialeschi (6) Program Services, Women and Leisure, Outdoor Recreation

Assistant Professor
Norman B. Bryan Jr. (9) Recreation Administration, Work and Leisure Attitudes, Research Methods

Research Assistant Professor
Candace Ashton-Shaeffer, Therapeutic Recreation, Recreation in the Schools

Professor Emeritus
H. Douglas Sessions

The Curriculum in Leisure Studies and Recreation Administration provides an interdisciplinary approach to the study of leisure and the preparation of specialists to work in the field of recreation and leisure services. The curriculum offers the Master of Science degree in Recreation Administration at the graduate level. Two specializations, therapeutic recreation services and recreation management, are available.

This Master of Science in Recreation Administration (M.S.R.A.) professional degree program combines both academic and practical experience. It is individualistic, with the specific requirements depending somewhat upon the student's undergraduate major, work experience, and professional objectives. Five courses (fifteen credits) comprise the core requirements. A minimum of nine to fifteen credits of course work in a specialization in Leisure Studies and Recreation Administration is required; the remaining credits of the 33-36 semester credit program may be taken in LSRA or related areas of study. Students with no background in recreation may be required to take corequisite classes the first semester of graduate study.
All students admitted to this program must fulfill the requirements for admission to the Graduate School. To be admitted, applicants will be required to have prerequisite training equivalent to an undergraduate major such as one of the following: Dramatic Art, Physical Education, Education, Political Science, Recreation, Sociology, or a related area. The M.S.R.A. normally requires four semesters to complete the degree requirements.

In addition to ten courses, three options are available for the fulfillment of the degree requirements. They are 1) a thesis (three to six credits), 2) a 480-hour full-time internship (four credits), or 3) two three-credit projects of independent study. The choice is based upon the student's interest and past experiences. Those students wishing to do further graduate work or those seeking an academic career normally elect the thesis option. For students experienced in recreation services or those employed as recreation specialists while pursuing their graduate degree, the six credits of independent field study are recommended. Students with limited practical experience who wish to seek a practitioner's role upon graduation are advised to choose the internship option.

All candidates for the M.S.R.A. degree are expected to have concurrent work experience with their course work. No academic credit is given for this experience, but it is a curriculum expectation. A variety of opportunities exist through the cooperative efforts of the various recreation services and agencies within the University and surrounding communities. Research and teaching assistantships are available. Work arrangements may be negotiated with local recreation providers.

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. Fall, spring, and summer. Bialeschki, Henderson.

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. Henderson. (B.A. level Social Science perspective.)

120 PROGRAM PLANNING FOR RECREATION SERVICES (3).
Prerequisite, LSRA 10. A study of the principles of planning recreation programs and the factors which affect their implementation and functioning. Fall. Staff.

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. Fall and spring. Staff.

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, finance, training, legislation, public relations, and coordination of community resources. Fall. Bryan.

175 INTRODUCTION TO THERAPEUTIC RECREATION SERVICES (3).
History and philosophy of therapeutic recreation. A survey of basic counseling/interpersonal styles, clinical and administrative skills, and inter/intra-disciplinary approaches to a variety of clinical settings. A five-hour practicum is required. 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. Fall. Staff.

177 DISABLING CONDITIONS AND THE PRACTICE OF THERAPEUTIC RECREATION (3).
Prerequisites, LSRA 175 and LSRA 176. Instruction in the relationship between various disabling conditions and the practice of therapeutic recreation. Spring. 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. Henderson, Bryan.

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, LSRA 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.

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 leisure 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 financial 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. Bryan.

290 INDEPENDENT FIELD STUDY (3). Permission of faculty. May be repeated for credit. Fall and spring. Staff.

393 THESIS (3). Staff.

400 GENERAL REGISTRATION (0). Staff.

DEPARTMENT OF LINGUISTICS

H. CRAIG MELCHERT, Chair

Advisory Committee: Professors R. Hendrick, L. Janda, L. King, W. Lycan, C. Maley, P. Roberge, M. Tsiapara; Associate Professor G. Wehelie; Assistant Professors M. Crowhurst, P. Gordon, M. Weiss

Professors
Randall Hendrick (11) Syntax, Celtic Linguistics
H. Craig Melchert (10) Indo-European Linguistics, Chinese Linguistics
Maria Tsiapara (7) Historical Linguistics, History of Linguistics, Dialectology

Associate Professor
Gert Wehelie (12) Syntax, Morphology, Germanic Linguistics

Assistant Professors
Megan Crowhurst (13) Phonology, Amerindian, Cognitive Science
Henry Gerfen (15) Phonetics, Phonology, Amerindian

Associated Faculty
Connie Eble, English Linguistics
Lawrence Feinberg, Slavic Linguistics
Samuel Fillenbaum, Psychology of Language
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
Thomas L. Layton, Language Acquisition, Language Disorders
William Lycan, Philosophy of Language
Catherine Maley, Romance Linguistics
Edward D. Montgomery Jr., Romance Linguistics and Philology
Stanley Munsat, Philosophy of Language and Linguistics
Patrick O'Neill, Celtic Languages

Paul Roberge, Historical Linguistics, Germanic Linguistics, Pidgins and Creoles
Michael Weiss, Indo-European, Iatric and Greek Linguistics

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 master's thesis.

The elective courses are expected to form a coherent program in a subfield 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 have the beginning of the second semester of residence choose a permanent adviser, 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 instructor of the corresponding course, who, after consultation with the director of Graduate Studies, 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 student's advisor in consultation with a committee of two others. 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 PHILOLOGY 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. Crowhurst, 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, morpholexical and morphophonemic rules, and the interaction of morphology with phonology and syntax. Fall. Crowhurst, Gerfen.

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. Spring. Hendrick, Weibelhuth.

133 SYNTAX II (Anthropology 193) (3). Prerequisite, Linguistics 130 or equivalent. Methods and theory of grammatical analysis, with special reference to transformational grammar. Fall. Hendrick, Weibelhuth.

137 SEMANTICS (3). Prerequisite, Linguistics 30, 100, or permission of the instructor. Semantics as a part of linguistic theory: co- and disjoint reference among nominals, "crossover" phenomena, quantifier scope, lexical semantics, Montague Grammar and compositional semantics, and explanatory universals in semantic theory. (On demand.)

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. Crosslinguistic 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 Urheimat 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.)

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.

154 HISTORY OF THE SPANISH LANGUAGE (See Spanish 126) (3).

155 SPANISH PHONETICS AND PHONOLOGY (See Spanish 145) (3).

156 THE STRUCTURE OF MODERN SPANISH (See Spanish 146) (3).

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 phonological analysis of original as well as published primary data. Fall, spring. Crowhurst, Gerfen.


164 HISTORY OF THE FRENCH LANGUAGE (See French 126) (3).

165 FRENCH PHONETICS (See French 145) (3).

166 STRUCTURE OF FRENCH (See French 146) (3).

170 SOCIOLINGUISTICS (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 relates with socioeconomic status, region, gender; the social motivation of change; language and economy; language maintenance, planning, shift. Spring. Roberge, 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 import for current theoretical issues (acquisition, universal language change). (On demand.) Roberge.

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 one other national context 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. Tsiapera.

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. Tsiapera.

206 THE STRUCTURE OF ARABIC (Arabic 230) (3). Tsiapera.

212 ADVANCED PROBLEMS IN PHILOSOPHY OF LANGUAGE (Philosophy 212) (3).

215 ADVANCED METHODS IN PHONOLOGY (3). Prerequisite, Linguistics 124. Methods of theoretical argumentation in generative phonology with emphasis on recent proposals in the published literature. Fall. Crowhurst, Gerfen.

216 ADVANCED METHODS IN SYNTAX (3). Prerequisite, Linguistics 133 or consent of the instructor. Examination of recent developments in the theory and methods of syntactic analysis. Fall. Hendrick, Weceluth.

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 extant 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.


283 CURRENT PROBLEMS IN LINGUISTICS (3). This course explores relations of linguistics with neighboring fields and theoretical problems of current relevance within linguistics itself; some attention given to pedagogical methodology. Fall and spring. Staff.

293 LINGUISTIC FIELD WORK (Anthropology 293) (3). Analysis and description of a language unknown to the class from data solicited from a native informant. Alternate years. Crowhurst, 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. Tsiapera.

361 SEMINAR (3). Seminar in phonological theory. Crowhurst, 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 Dharmacakra, the Sutras, Brahmans, and the Vedas. (On demand.) Staff.

202 ADVANCED SANSKRIT (3). Continuation of 201. (On demand.) Staff.

For Arabic see listings under Romance Languages; for Irish and Welsh see under English; for Hebrew see under Religious Studies; and for Chinese and Japanese see under Asian Studies in the Undergraduate Record.

DEPARTMENT OF MARINE SCIENCES

JOHN M. BANE JR., Chair

Professors
John M. Bane Jr. (27) Physical Oceanography, Gulf Stream Dynamics, Ocean-Atmosphere Interactions
Larry K. Benninger (41) Sedimentary Geochemistry
Joseph G. Carter (34) Marine Paleobiology, Molluscan Systematics
Miles A. Crenshaw (32) Biochemistry, Lipidification
Dirk Frankenber (3) Biological Oceanography
Mark E. Hay (44) Marine Ecology, Chemical Ecology, Prey-Consumer Interactions
Jan J. Kohlmeyer (22) Marine Botany, Fungi
Christopher S. Martens (10) Marine Geochemistry
A. Conrad Nesmann (12) Geological Oceanography
Drs W. Paetl (39) Microbial Ecology
Charles K. Paul (49) Continental Margin Geology
Charles H. Peterson (31) Ecology, Population Interactions
Fredrick K. Pfender (13) Microbiology
John T. Wells (47) Marine Geology, Coastal Geomorphology
Francisco E. Werner (8) Physical Oceanography, Coupled Physical and Biological Processes

Associate Professors
Timothy J. Bralower (30) Micropaleontology, Marine Stratigraphy
Niel Lindquist (53) Chemical Ecology, Natural Products
Richard A. Luecht (48) Coastal Water Dynamics and Quality

Assistant Professors
Marc J. Alpert (51) Chemical Oceanography, Biogeochemistry
Carol Arnosti (46) Marine Organic Geochemistry

Research Assistant Professors
Thomas J. Shay (50) Gulf Stream Dynamics, Air-Sea Interaction, Turbulence

Adjunct Professors
Frederick M. Bingham (Physics) Circulation and Water Mass Transporation
Max H. Hammersand (Biology) Marine Botany, Algae
William M. Kier (Biology) Functional Morphology of Invertebrates, Biomechanics
Joseph Pawlak (UNC-Wilmington, Biology) Marine Ecology
Martin H. Posey (UNC-Wilmington, Biology) Population Dynamics of Marine Organisms
Stanley R. Riegs (ECU, Geology) Formation of Phosphorites in Marine Environments
John J. W. Rogers (Geology) Geochemistry, Crustal Evolution
Stephen A. Skraba (UNC-Wilmington, Chemistry) Trace Metal Geochemistry in Natural Waters
Mark D. Selby (Environmental Sciences) Environmental Health Microbiology

Arthur J. Spivack (UNC-Wilmington, Chemistry) Boron and Chlorine Isotope Geochemistry
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 curriculum and from the IMS.

Courses and facilities at other coastal laboratories are also available to curriculum 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 curriculum, 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.

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, 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.

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.

Marine Sciences Core Courses

103 GEOLOGICAL OCEANOGRAPHY (Geology 188) (4). Prerequisite, Geology 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. Fall. Neumann.

104 BIOLOGICAL OCEANOGRAPHY (Biology 140, Environmental Sciences 136) (4). Prerequisite, Biology 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. Five lecture and five laboratory hours a week Summer (alternate years). (Offered on demand at the Institute of Marine Sciences, Morehead City, North Carolina) Staff.

105 CHEMICAL OCEANOGRAPHY (Environmental Sciences 128) (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. Spring. Alperin, Arnosti, Martens.

106 PHYSICAL OCEANOGRAPHY (Geology 106) (4). Prerequisites, Math 31, 32, Physics 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.

Other Marine Sciences Courses

101 OCEANOGRAPHY (Biology 126, Environmental Sciences 127, 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 Geology 12. Three lecture hours a week. Fall, Neumann. 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.

111 ALGAE (Biology 111) (3). Prerequisites, Biology 11, 11L. An introduction to the development, biology, ecology, and evolutionary significance of algae. Three lecture hours a week. Spring. Hommesand.

113 MARINE ALGAE (Biology 113) (4). Prerequisites, Biology 11, 11L. Structure, reproduction, systematics, and ecology of marine algae. The laboratory will include field studies and culture techniques. Two lecture and four laboratory hours a week. Spring. Hommesand.

119 MARINE BIOGEOCHEMISTRY (ENVR 119) (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 (Geology 123) (4). Prerequisite, permission of the instructor. Chemical and biological origins of calcium carbonate, skeletal structure and chemomineralogy, 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, Crenshaw.

125 COASTAL SEDIMENTARY ENVIRONMENTS (Geology 125) (3). Prerequisite, Geology 56. 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.

133 MICROPALEONTOLOGY (Geology 133) (4). Prerequisite, Invertebrate Paleontology 132, or Marine Ecology 146, or permission of the instructor. An in-depth study of the biostatigraphy, paleoecology, and taxonomy of various microfossil groups (i.e., Foraminifera, ostracodes, conodonts, coccoliths, Radiolaria, diatoms, acritarchs, dinoflagellates, etc.) depending on individual student objectives. Three lecture and three laboratory hours a week. On demand. Binlower.
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. Spring. Frankenbegr.

137 ECOLOGY OF WETLANDS (Environmental Sciences 137) (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 ECOLOGY 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 (Geology 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 ecological sciences emphasizing processes controlling chemical distributions in sediments, fresh and salt water, the atmosphere, and fluxes between these reservoirs. Spring. Martens, Alperin, Arnosti.

141 SPECIAL PROBLEMS IN MARINE BIOLOGY (Biology 141) (4). Prerequisites, Biology 140 and permission of the instructor. Survey of current problems and intellectual approaches in any of the following areas: Marine Ecology (Hay, Peterson); Marine Chemical Ecology (Hay, Lindquist); Marine Microbes (Kohlmeyer, Paetl). Hours and credits by prior agreement (with five or more laboratory and conference hours a week) or unit credit. Fall, spring, first or second summer sessions (offered on demand at Morehead City, North Carolina). Staff of Institute of Marine Sciences.

143 BIOGEOCHEMICAL TECHNIQUES (2). Pre- or corequisite, Marine Sciences 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 (Geology 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 (Geology 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. Benninger.

146 MARINE ECOLOGY (Biology 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, Hay.

148 MARINE BIOLOGY (Biology 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. Frankenbegr.

151 FLUID DYNAMICS (Geology 181, Physics 151) (3). Prerequisite, 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 a week. Fall. Shay.

152 MARINE SYSTEMS MODELING (Geology 14) (3). Prerequisite, Math 32 or permission of the instructor. Mathematical modeling of the flow, nutrient chemistry, and lower trophic levels in a marine system; mathematical modeling of sedimentary geochemical processes; the fundamental budget equation; turbulent transport; numerical techniques. Three lecture hours a week. Spring. (Alternate years) Werner, Alperin.


155 TURBULENT BOUNDARY LAYERS (2). Prerequisite, MASC 106 or MASC 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. Luettich.

156 DESCRIPTIVE PHYSICAL OCEANOGRAPHY (Geology 143) (3). Prerequisite, MASC 106 or permission from 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. Three lecture hours a week. Spring. (Alternate years.) Bane.

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. Bane, Luettich, Shay, Werner.

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, geological, and biological 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, Biology 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. Kohlmeyer.

216 MARINE PHYCOLOGY (Biology 216) (5). Prerequisite, Biology 111. Structure, reproduction, systematics, and ecology of marine algae. The laboratory includes field studies and culture techniques. Three lecture and six laboratory hours a week. Fall. (Alternate years.) Homsersand.

221 NUMERICAL ODE/PDE I (MATH 221, ENVR 221) (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 222) (3). Elliptic equation methods (finite differences, elements, integral equations); hyperbolic conservation laws methods (Lax-Friedrich, characteristics, entropy condition, shock tracking/capturing); spectral, pseudo-spectral methods; particle methods, fast summation, fast multipole/vortex methods. Spring. Minion.
228 MATHEMATICAL MODELING I (MATH 228, ENVR 228)
(3). Nondimensionalization and identification of leading order physical effects with respect to relevant scales and phenomena; deviation of classical models of fluid mechanics (lubrication, slender filament, thin filimg, Stokes flow); deviation of weakly nonlinear envelope equations. Fall. Camassa.

229 MATHEMATICAL MODELING II (MATH 229, ENVR 229)
(3). 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. Camassa.

250 MODELING DIAGENETIC PROCESSES (3). Prerequisite, MASC 152 or permission of the instructor. An introduction to the theory and application of modeling biogeochemical processes in sediments. Diagenetic theory, numerical techniques, and examples of recently developed sediment models. Three lecture hours a week. Spring. Alternate years. Alperin.

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.

252 OCEAN CIRCULATION THEORY (3). Prerequisite, 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, Shay, 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, fronts, estuaries. Fall. (Alternate years.) Werner, Luettich.

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. Bane, Shay, Werner.

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 110: Invertebrate Paleontology. Carter.
- Biology 120: Comparative Physiology. Kier.
- Biology 120L: Comparative Physiology Laboratory. Kier.
- Biology 155: Comparative Biomechanics. Kier.
- Biology 186L: Community and Systems Ecology Laboratory. Rice.

Environmental Sciences 122: Chemical Equilibrium in Natural Waters. Johnson, Singer.
- Environmental Sciences 124: Environmental Analytical Chemistry. Charles.
- Environmental Sciences 132: Limnology and Water Pollution. Staff.
- Environmental Sciences 133: Sources, Transport, and Fate of Environmentally Important Materials. Staff.
- Environmental Sciences 134: Environmental Microbiology. Pfender.
- Geology 150: History of the Earth. Rogers, Bralower.
- Geology 151: Geodynamics. Rogers.
- Geology 164: Geochemistry of Natural Waters. Benninger.
- Geology 221: Sedimentary Petrology. Teichert.
- Math 129: Mathematical Models for the Physical Sciences II. Kerman.
- Physics 103: Mechanics I. Hernandez.
- Statistics 102: Statistical Methods II. Chakravarti.
# Department of Mathematics

**Patrick B. Eberlein, Chair**

**Professors**
- Idris Asani (44) Dynamical Systems, Ergodic Theory of Operators
- Thomas H. Brylawski (2) Combinatorics
- 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 (38) Ergodic Theory, Dynamical Systems
- Douglas G. Kelly (15) Modelling, Data Analysis, Combinatorics, Probability Theory
- Norberto Kerzman (32) Several Complex Variables, Partial Differential Equations
- Shrawan Kumar (46) Representation Theory, Geometry of Flag Varieties
- Karl E. Petersen (20) Ergodic Theory
- John A. Pfaltzgraft (22) Complex Analysis
- Joseph F. Plante (23) Foliations, Dynamical Systems
- Robert A. Proctor (43) Combinatorics, Representation Theory
- Michael Schlessinger (24) Algebraic Geometry, Commutative Algebra
- 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
- Alexandre 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**
- Roberto A. Camassa (16) Mathematical Modeling, Nonlinear Waves, Propagation, Dynamical Systems
- Philippe DiFrancesco (31) Mathematical Physics

**Assistant Professor**
- Michael L. Minion (11) Scientific Computation, Computational Fluid Dynamics, Adaptive Mesh Refinement

**Professors Emeriti**
- Robert L. Davis
- Robert G. Heyman
- W. Robert Mann
- Ancel C. Mewborn
- Johann 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. The M.A.T. degree is also available with a major in mathematics in the School of Education.

The separate departments of Mathematics, Physics and Astronomy, and Statistics are housed in Phillips Hall, as are the Computation Center and the special library for these three departments and for the Department of Computer Science. 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. Applicants 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 January 31.

## Degree Requirements

The general regulations of the Graduate School govern the work for graduate degrees in mathematics. Specific requirements are explained below. A graduate student in mathematics may receive credit only for mathematics courses numbered 137 and above.

The requirements for a master's degree are flexible, but all aspects of the program must be approved by the director of Graduate Studies. The requirements include: programming ability at the level of Computer Science 14; satisfactory completion of thirty semester hours of approved course work; demonstration of either a basic reading knowledge of an approved foreign language (usually French, German, or Russian), or demonstration of a working knowledge of an approved computer programming language; completion of a master's project for a Master of Science degree, or a master's thesis for a Master of Arts degree; and successful performance in an oral examination covering both course work and the master's project or thesis. A detailed statement on the master's degree requirements is available from the department. The department considers two years as the normal time to complete these requirements. The course schedule for a first-year graduate student will depend upon the student's undergraduate training; one typical schedule is as follows. Fall semester: two courses from Mathematics 180, 186, 193, 203, and one elective course from one of the other mathematical or physical sciences. Spring semester: two courses from Mathematics 181, 196, 204, 230, and one elective course from one of the other mathematical or physical sciences.

No minimum number of semester hours is required for a Ph.D.; however, doctoral students must satisfactorily complete Mathematics 180, 181, 186, 193, 196, 203, 204, 230, 231, and 271 or 286 and usually complete a total of at least forty-eight semester hours in preparation for writing a dissertation. The Graduate School requires a minimum of three hours of Mathematics 394.

Requirements for a Ph.D. include programming ability at the level of Computer Science 14, a reading knowledge of two foreign languages chosen from French, German, Russian, or other language approved by the director of graduate studies, successful performance on a comprehensive examination covering basic
course work, a minimum of two semesters' instructional service, successful performance on a doctoral oral examination covering specialized topics in the area of proposed research, and the writing of a dissertation. The department considers four years as the normal time to complete these requirements.

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 adviser 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

The name of the instructor who last taught the course appears after the course. It is not necessarily the name of the instructor who will next teach the course.

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.) Brylawski.

106 MATHEMATICAL METHODS IN BIOSTATISTICS (Biostatistics 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. Staff.

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. Staff.

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. Plante.


118 BASIC CONCEPTS OF ANALYSIS (3). Prerequisites, 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. Staff.

120 PROBABILITY (3). Prerequisites, Mathematics 33 and Mathematics 81. Foundations of probability; random variables and distribution functions; the binomial, Poisson, and normal distributions; expectation, moments, moment-generating functions; compound events and joint distributions; limit theorems; applications. Spring. Ji.

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. Goodman, Pfaff, Wogen.

122 ADVANCED CALCULUS II (3). Prerequisite, Mathematics 121. Functions of several variables; derivative as linear transformation; inverse and implicit function theorems; multiple integration. Spring. Taylor.

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. Cima.


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.

128 MATHEMATICAL METHODS FOR THE PHYSICAL SCIENCES I (3). Prerequisites, Mathematics 83 and Physics 24-25, or equivalent. Fourier series and transform. Laplace transform. Applications to physical problems. Complex variables methods. Fall.


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, orientability, vector fields on surfaces, tesselations and fundamental group. Research problems discussed at elementary level. Spring.

131 EUCLIDEAN AND NON-EUCLIDEAN GEOMETRIES (3). Prerequisite, Mathematics 32 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. Goodman.

133 ELEMENTARY THEORY OF NUMBERS (3). Prerequisites, Mathematics 32 and 81. Divisibility, Euclidean algorithm, congruences, residue classes, Euler's function, primitive roots, Chinese remainder theorem, quadratic residues, number theoretic functions. Farey and continued fractions, Gaussian integers. Fall and spring. Sonner.

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. Smith.


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, finite fields. Fall and spring. Heyneman.
146 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. Kelly.

147 MATRIX THEORY (3). Prerequisite, Mathematics 83 or equivalent. Computational aspects of algebra of matrices with applications; determinants; numerical solution of linear systems; norms and error estimates; eigenvalues; linear programming. Math 116 covers elementary aspects of linear systems and matrices and may not be taken for credit after credit has been granted for Math 147. Fall, spring, and summer. Staff.

148 COMBINATORIAL MATHEMATICS (Statistics 150) (3). Prerequisite, Mathematics 81 or permission of the instructor. Recurrence relations and generating functions; graph and graph algorithms, principle of inclusion-exclusion. Fall. Smith.

151 DETERMINISTIC MODELS IN OPERATIONS RESEARCH (Statistics 181, ORSA 181) (3). Prerequisite, Mathematics 147. Linear, integer, nonlinear, and dynamic programming; classical optimization problems; network theory. Fall and spring. Staff.

155 INTRODUCTION TO DYNAMICS (3). Topics will vary and may include iteration of maps, orbits, periodic points, attractors, symbolic dynamics, bifurcations, fractal sets, chaotic systems, systems arising from different equations, iterated function systems and applications. Goodman, Hawkins, Petersen, Plante.

157 TOPICS IN MATRIX THEORY (3). Prerequisite, 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. Murphry.

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 (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 methods, 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. Kelly.

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 optimization. Fall. Goodman.

176 TOPICS IN ALGEBRA (3). Prerequisite, consent of the instructor. Topics may include number theory, algebraic number theory, field theory, and algebraic geometry. Sonner.

177 TOPICS IN GEOMETRY (3). Prerequisite, consent of the instructor. Topics may include non-Euclidean geometries, linear geometry, finite geometries, topology, and algebraic geometry. Sonner.

180 GEOMETRY OF CURVES AND SURFACES (3). Prerequisite, advanced calculus. Topics include: (curves) Frenet formulas, isoperimetric inequality, theorems of Crofton, Fenchel, Fary-Milnor; (surfaces) fundamental forms, Gaussian and mean curvature, special surfaces, geodesics, Gauss-Bonnet theorem. Fall. Plante.


186 LINEAR ALGEBRA (3). Prerequisite, Mathematics 138 or permission of the instructor. Vector spaces, linear maps, determinants; commutative rings, algebras, polynomials; structure of operators; inner products. Fall. Wahl.

189 ENUMERATIVE COMBINATORICS (3). Prerequisite, Mathematics 138 or permission of the instructor. Basic counting, partitions, recursions and generating functions, signed enumeration, counting with respect to symmetry, plane partitions and tableaux. Proctor.

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 projective geometries, codes and designs. Brylawski.

191, 192 APPLIED AND COMPUTATIONAL MATHEMATICS (3 each). Prerequisites, linear algebra, advanced calculus, and knowledge of a computer language appropriate for mathematical programming; 191 is a prerequisite to 192. Basic mathematical concepts and computational procedures used in modelling and solving problems from science and engineering. Topics include equilibrium problems, approximation methods, numerical solution of differential equations, and numerical analysis. Fall and spring. Tolle, Cohen.

193 INTRODUCTORY ANALYSIS (3). Prerequisite, advanced calculus. Elementary metric space topology; continuous functions; differentiation of vector-valued functions; implicit, inverse function theorem. Topics from: Weierstrass theorem; existence and uniqueness theorems for differential equations, series of functions. Fall. Hawkins.


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, Liapounov stability and structural stability, critical point analysis. Spring. Plante.

Courses for Graduates


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. Taylor.
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. Assani.

205 ADVANCED COMPLEX ANALYSIS (3). Prerequisite, Mathematics 196. Laurent series; Mittag-Leffler and Weierstrass Theorems; Riemann mapping theorem, Runge's theorem; additional topics chosen from: harmonic, elliptic, univalent, entire, meromorphic functions; Dirichlet problem; Riemann surfaces. Fall. Pfaltzgraf.

206 SEVERAL COMPLEX VARIABLES (3). Prerequisite, Mathematics 196. Elementary theory, the Cousin problems, domains of holomorphy, Runge domains and polynomial approximation, local theory, complex analytic structures, coherent analytic sheaves and Stein manifolds, Cartan's theorems. Spring. (Alternate years.) Kerman.

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. Williams.

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.) Staff.

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. Cohen, Murphy, Tolle, Kelly.

224 HARMONIC ANALYSIS (3). Prerequisite, consent of the instructor. Subjects may include topological groups, abstract harmonic analysis, Fourier analysis, noncommutative harmonic analysis and group representation, automorphic forms, and analytic number theory. Fall. (Alternate years.) Taylor.


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. Fall. (Alternate years.) Cherednik.

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.) Brylawski.

257 ALGEBRAIC GEOMETRY (3). Prerequisite, Mathematics 230. 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.) Kumar.

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. Petersen.


272 DIFFERENTIAL GEOMETRY (3). Prerequisite, Mathematics 271. Riemannian geometry, first and second variation of area and applications, effect of curvature on homology and homotopy, Chern-Weil theory of characteristic classes, recent applications due to Bott, Chern-Simons, and Baum-Cheeger. Spring. Eberlein.

273, 274 LIE GROUPS AND LIE ALGEBRAS (3 each). Prerequisites, Mathematics 186 and 271. Relationship between Lie groups and Lie algebras, classification of complex semi-simple Lie algebras, representation theory, applications to geometry, cohomology of Lie algebras, compact groups. Fall and spring. (Alternate years.) Varchenko.

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.) Varchenko.

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. Wahl.

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.) Staff.

390 SEMINAR AND DIRECTED READINGS (1-3).

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).

400 GENERAL REGISTRATION (0).

DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY
JEFFREY A. FRELINGER, Chair

Professors
Stephen L. Barchechter (30) Molecular Biology of Viruses
Kenneth F. Bitt (3) Molecular Biology of Mycoplasmas, Bacterial Genomes
Janne G. Cannon (43) Genetics of Pathogens, Pathogenesis of Infectious Disease
Stephen H. Clarke (53) Molecular Immunology, Structure and Function of Immunoglobin Genes
Myron S. Cohen (55) Biochemistry and Physiology of Phagocyte-Pathogen Interaction
Philip C. Cohen (49) Mechanisms of Autoimmune Disease
Marshall H. Edgell (7) Genetic Engineering, Molecular Biology
James D. Folds (9) Immunology of Treponema Pallidum Infection, Clinical Immunology
Jeffrey A. Frelinger (47) Immunogenetics, Cellular Immunology
Peter H. Gilligan (51) Bacterial Toxins, Clinical Microbiology
Jack Griffith (35) Chromosome Structure: Viruses and Their Host Cells
Nortin M. Hadler (26) Mechanism and Control of Chronic Inflammatory Response
J. Stephen Haskill (38) Cancer Immunology, Role of Antibody, Macrophages, Chemoimmunotherapy
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 $15,000 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. Applications must be complete by February 1.
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 preceptor. First-year students generally take two didactic (lecture) courses each semester, in addition to the laboratory rotations. Most students take MCRO 108 and 109 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 MCRO 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, Biology 11, or Microbiology 51 or 55, and Chemistry 11, 21. For students with primary focus other than immunology. Immunochemistry; genetic control, regulation, and development of cells and cell interactions; hypersensitivity, autoimmunity, resistance to infection. Two lectures, one seminar. Fall. Ting.

115 SPECIAL TOPICS IN BACTERIOLOGY 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 (1) (Cell Biology 117, Biochemistry 117, Pharmacology 117) (Var.). Prerequisites, graduate cell biology or biochemistry permission of the instructor. Comprehensive introduction to cell structure, function, and transformation. Fall. Jacobson, Lee, Meisner, Parise.

118 CELL STRUCTURE, FUNCTION AND GROWTH CONTROL II (Cell Biology 118, Biochemistry 118, Pharmacology 118) (Var.). Prerequisites, undergraduate cell biology or biochemistry permission of the instructor. Comprehensive introduction to cell structure, function, and transformation. Spring. Jacobson, Lee, Meisner, Parise.

120 MICROBIAL PATHOGENESIS (4). Molecular and biological basis of pathogenic properties of bacteria. Three lecture hours per week. Spring. (Alternate years) Kawula, staff.

130 VIROLOGY (4). Current concepts of the chemistry, structure, replication, genetics, and natural history of animal viruses and their host cells. Four lecture hours a week. Fall. Bachemheimer.

156 GROWTH CONTROL IN NORMAL AND NEOPLASTIC CELLS (3). Topics include growth factors and their receptors, signal transduction, oncogenes, and anti-oncogenes. Three lecture hours. Spring. Lee.

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 Workshops 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 (3). 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 (3). 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 (3). 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.

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.

400 GENERAL REGISTRATION (0).
DEPARTMENT OF MUSIC

JOHN L. NÁDAS, Chair
Mark Evan Bonds, Director of Graduate Studies

Professors
Mark Evan Bonds (6) Late Eighteenth- and Nineteenth-Century Music
Jon W. Finson (36) Nineteenth-Century Music, American Music
James W. McKinnon (3) Medieval Music
John L. Nádas (37) Late Medieval Music, Italian Opera
Severine Neff (12) Twentieth-Century Music, Theory
Thomas A. Warburton (17) Twentieth-Century Music, Theory, American Music

Associate Professors
Allen Anderson (4) Theory
John R. Covach (35) Twentieth-Century Music, Theory, Popular Music

Assistant Professors
Sean Gallagher (11), Renaissance Music
Carol Muller (2), Ethnomusicology
David L. Schurzberg (8), Seventeenth- and Eighteenth-Century Music,
Performance Practice, Early Keyboard

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/index.html.

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.
Music 110, Advanced Musicianship (passed with a grade of P
or better), 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., fif-
teen 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 in
addition to Music 110 and write a thesis that is a revision of a
paper prepared for a graduate course. All candidates for a mas-
ter'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 exami-
nation is given to those who wish to proceed to the Ph.D. pro-
gram after finishing the M.A. Students already in the depart-
ment'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 com-
pletion of course work and language requirements, Ph.D. stu-
dents 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 nec-
essary but may be indicated on the general application form for
admission to the Graduate School. Selected applicants are nomi-
nated for university-wide awards that range from $9,000 to
$14,000. 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 par-
tial 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 MUSICOLOGY (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.

102 SURVEY OF MUSIC STYLES (3). Survey of the chief styles of
music history, with emphasis on methods of analysis, examination of rep-
resentative scores, written exercises, and related readings.
103 INTRODUCTION TO THE MUSIC OF ASIA (3). A survey of the traditional and folk music of the major civilizations and the island cultures of Asia. Methods, resources, and philosophies of ethnomusicology are also considered.

104 FOLK MUSIC OF EUROPE AND THE NEW WORLD (3). A study of folk music in European countries, emphasizing similarities in the British Isles and southern United States.

110 ADVANCED MUSICIANSHIP (3). Advanced study in sight-singing (including techniques related to solfège, reading in clefs, dictation, and keyboard (including figured bass, harmony and instrumentation, and score reading) Fall. Anderson, Neff, Warburton.

114 TWENTIETH-CENTURY HARMONIC TECHNIQUES (3). Prerequisite, Music 38.

132 FOLK AND POPULAR MUSIC OF LATIN AMERICA (FOLK 103) (3). Folk and popular music of Latin America in cultural context, emphasizing Mexican song traditions, music of Andean highland Indians, and West African-derived genres. Music literacy not a prerequisite.

133 FOLK, POPULAR, AND ART MUSIC IN NINETEENTH-CENTURY AMERICA (FOLK 107) (3). How the identities of and changes in selected genres of folk, popular, and art music illustrate social, racial, and economic aspects of nineteenth-century America. Music literacy not a prerequisite.

134 MUSIC IN TWENTIETH-CENTURY AMERICAN CULTURE (3). How technological, societal, and aesthetic factors shaped American folk and popular music (and to a lesser degree art music) in the age of mechanical reproduction. Music literacy not a prerequisite.

135 AMERICAN MUSIC (3). Its growth and development from the early colonies to the present.

136 PERFORMANCE PRACTICES (3). Problems of rhythm, ornamentation, articulation, and expression in both instrumental and vocal music, with emphasis on the period from 1550-1825 and practical applications in an informal collegium musicum. Schullenberg.

140 ORATORIO (3). The development of the genre from its origins to the present.

141 THE MADRIGAL (3). Its international flowering, especially at the peak of music's Renaissance era.

142 OPERA (3). A survey of the types, national and international trends, conflicts, and chief masterworks from opera's beginning around 1600 to the present.

144 ART SONG (3). A study of the development of this genre, especially during its great flowering in the Lieder, melodies, and other national types of the nineteenth century.

147 THE SYMPHONY (3). The growth of the symphony as an independent orchestral genre, especially in the masterworks from Haydn, Mozart, and Beethoven to Prokofiev, Piston, and other twentieth-century composers.

149 GENRE STUDIES (3). Other specific surveys of genres, forms, and styles of music in keeping with the Music 140-148 series.

150 FRANZ JOSEPH HAYDN (3). The man and his times, his music, and its styles.

151 J. S. BACH (3). With special attention alternately to the vocal and the instrumental works.

152 MOZART (3).

153 BEETHOVEN (3).

154 HANDEL (3).

155 BRAHMS (3).

156 WAGNER AND VERDI (3).

157 DEBUSSY AND RAVEL (3).

158 STRAVINSKY AND SCHOENBERG (3).

159 COMPOSER STUDIES (3). Other specific surveys in keeping with Music 150-158.

160 PEDAGOGY OF THEORY (3). Techniques of teaching evaluation of current books, scores, and anthologies covering all aspects of sight-singing, keyboard, analysis, and written approaches to harmony and counterpoint. Practical classroom experience.


165 SURVEY OF CONTRAPUNTAL TECHNIQUES (3). Renaissance, Baroque, and early twentieth century; analysis and imitative writing.

240 PROSEMINAR IN MEDIEVAL MUSIC (3). Study of selected topics in Medieval music. Emphasis on basic stylistic aspects and problems of analysis, and on both primary and secondary sources and bibliography. Independent work is stressed, in preparation for more developed, independent research at the seminar level (Music 337). Lectures and student reports. McKinnon, Nadas.

241 PROSEMINAR IN RENAISSANCE MUSIC (3). In keeping with Music 240. Gallagher, Nadas, Warburton.

242 PROSEMINAR IN BAROQUE MUSIC (3). In keeping with Music 240. Schullenberg.

243 PROSEMINAR IN CLASSIC MUSIC (3). In keeping with Music 240. Bonds.

244 PROSEMINAR IN ROMANTIC MUSIC (3). In keeping with Music 240. Finson.

245 PROSEMINAR IN MODERN MUSIC (3). In keeping with Music 240. Anderson, Covach, Neff, Warburton.

246 PROSEMINAR IN AMERICAN STUDIES (3). Study of selected topics from the musical history of America, from Colonial times to the early twentieth century. Advanced bibliography in American musicology. Research topics relating principally to primary sources. Lectures and student reports. Covach, Finson, Warburton.

248 PROSEMINAR IN MUSIC THEORY (3). Study of either a single theorist and his writings, a specific analytical technique, or a particular theoretical issue. Covach, Neff, Warburton.

249 PROSEMINAR IN MUSICOGY (3). Other specific surveys dealing with the music of a certain limited period or locale, or concerned with some special concept.

251 ARS ANTIQUA AND ARS NOVA (3). Notation, performance practices, liturgical functions, social functions, concordances, structural principles, and extramusical influences. McKinnon, Nadas.


261 ANALYTICAL TECHNIQUES (3). Techniques of analysis of music from the Middle Ages to the present. Covach, Neff, Warburton.

298 SPECIAL STUDIES. The faculty assists and advises graduate students' research or creative work. Hours and credits to be arranged. Staff.

337 SEMINAR IN MUSICOGY (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.

400 GENERAL REGISTRATION (0).
CURRICULUM IN NEUROBIOLOGY

GERRY S. OXFORD, Director

Professors
Andrew R. Blight (132) Neurobiological Aspects of Traumatic Spinal Cord Injury and the Physiology and Pathophysiology of Myelinated Axons
W. E. Bollenbacher (109) Developmental Neuroendocrinology
Thomas W. Bondin (98) Neurotoxicology, Models of Peripheral Neuropathy, Blood-Brain Barrier
George R. Breeze (2) Cellular and Molecular Neurobiology, Neuropharmacology, Alcoholism, Adaptive Mechanisms
Fulton T. Crews (133) Molecular Aspects of Neuronal Vitality and Alcohol
Linda Dykstra (51) Behavioral Pharmacology, Opioid Analgesics, Opioid/Immune Interactions
Frederic L. Eldridge (74) Neural Control of Respiration
Paul B. Farell (11) Axon Guidance, Regulation of Neuron Number
Stanley C. Frohner (127) Molecular Neurobiology of Synapse Formation and Function, Ion Channel Localization and the Cytoskeleton
Lawrence I. Gilbert (79) Biochemical and Molecular Insect Neuroendocrinology
T. Kendall Harden (59) G-proteins, Phospholipase C, and Receptor-Mediated Regulation of Second Messenger Signaling; P2-purinergic Receptors
O.W. Herson Jr. (63) Auditory Physiology; Comparative Anatomy of Auditory System; Bioenergetic-Anatomical, Physiological, and Behavioral Correlates
Mark Hollins (125) Somatosensory Information Processing, Perception
James F. Howard Jr. (93) Electrophysiology of Neuromuscular Disorders, Synaptic Transmission
Jean M. Lander (71) Neurotransmitters as Developmental Signals, Neuronal-Glia Interactions, Neurotoxins and Developing Neurontimer Systems
Jeffrey A. Lieberman (141) Neurobiology of Psychiatric 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
P. Kay Lund (88) Growth Factors: Molecular Biology, Signal Transduction and Role in Nervous System Development and Aging
Richard B. Mailman (82) Biochemical and Molecular Pharmacology of Dopamine Receptors, Molecular Drug Design
Patricia F. Manes (90) Cell Adhesion and Signal Transduction in Developing Neurons
Ken D. McCarthy (77) Neuronal-Glia Interaction In Vitro and In Vivo
David L. McLellan (23) Chemistry of Regeneration and Degeneration in Spinal Mammalian Neurons
Gerhard W. Meisner (55) Excitation-Contraction Coupling, Intracellular Calcium Release Channels
Pier Morell (27) Neurochemistry: Gene Expression Related to Myelin Metabolism, Mechanisms of Denyelination, Brain Lipid Metabolism; Neurotoxicology
Gerry S. Oxford (67) Biophysics of Excitable Membranes, Ion Channels and Neurosecretion
H. Benjamin Peng (92) Development of Synapse, Cellular and Developmental Neurobiology
Edward R. Perl (35) Neural and Molecular Mechanisms for Pain and Other Somatic Sensations
Peter Petrus (36) Amino Acid and Peptide Neurotransmitters, Neuroendocrinology, Reproductive Biology
Aldo Rustioni (50) Excitatory and Inhibitory Neurotransmitters in Somesthesia
Robert Sealock (58) Cell Biology and Biochemistry of the Neuromuscular Junction, Dystrophin and Dystrophin-Associated Proteins
Paul G. Shinkman (41) Neural and Behavioral Plasticity in Sensory Systems
Ann E. Stuart (76) Transmission at Photoreceptor Synapses, Mechanisms and Control of Histamine Release and Re-uptake at Synapses and Their Effect on Signal Transfer
Kathleen K. Sukin (131) Teratology, Embryology
Kinya I. Suzuki (96) Neuropathology of Inborn Errors of Metabolism, Glial Reactions to CNS/PNS Degeneration
Kunihiko Suzuki (95) Molecular Genetics of Lysosomal and Other Neurogenetic Disorders
Jenny P. Ting (105) Role and Regulation of Immune Response Gene in Neurodegeneration, Microglial Gene Activation and Function
Terry A. Van Dyke (143) Cell Growth Regulation, Cancer, Gene Expression
Barry L. Whitsel (46) Somatosensory Mechanisms
R. Mark Wightman (118) Neurotransmitters, Neuromodulators, Neurochemistry
R. Haven Wiley (47) Social Organization and Communication in Vertebrates

Associate Professors
Stephen T. Crews (129) Molecular Genetics of Nervous System Development, Transcriptional Control
Gregory K. Essick (106) Somatosensory Psychophysiology and Neurophysiology
James C. Garbutt (134) Neurobiology and Psychopharmacology of Alcoholism
Michael F. Goy (111) Biochemistry and Physiology of Excitable Cells, Second Messenger Mechanisms in Signal Transduction
Robert S. Greenwood (61) Neuropeptide and Neuroendocrine Plasticity and Seizures
Henry S. Hsiao (18) Interfacing Computers
Donald T. Lysle (122) Neuroimmunology, Learning Processes
William Maixner (112) Pain Mechanisms and Analgesia
A. Leslie Morrow (121) Molecular Neurobiology of GABA Receptors and Alcoholism
Barry S. Pallotta (87) Stochastic Properties of Single Ion Channels
Cort A. Pedersen (91) Neuroendocrinology and Neuropharmacology of Parenting and Sexual Behavior, Behavioral and Psychological Role of Oxytocin and Vasopressin, Psychobiology of Postpartum Depression
Brian J. Popko (113) Myelin, Nerve Regeneration, and Transgenic Mice
Robert L. Rosenberg (115) Regulation of Ion Channels
Richard J. Samulski (135) Development of Viral Vectors for Brain Specific Gene Delivery
Alan L. Willard (101) Neural Development, Molecular Mechanisms of Neurodevelopment

Assistant Professors
Regina M. Carelli (142) Behavioral Neurophysiology, Neurobiology of Drug Abuse, Brain Reward Systems
Richard E. Cheney (136) Molecular Motors in the Nervous System, Cellular and Molecular Neurobiology of the Cytoskeleton
John H. Gilmore (137) Human Brain Development, Immune Regulation of Neurodevelopment, Schizophrenia
Lian Li (138) Transcriptional Regulation of Neuron-Specific Gene Expression, Molecular Neurobiology of Synaptogenesis, Molecular Genetics of Synaptic Transmission, Gene Targeting
Kenneth J. Lohmann (130) Neurochemistry and Invertebrate Zoology
Glenn K. Matsushima (139) Neuroimmunology, Function of Activated Microglia in Neurodegenerative Disease
Sharon L. Milgram (140) Protein Trafficking, Biosynthesis of Neuropeptides

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, 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, 122, 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 behavioral effects. Fall, Cariney; spring, Lytle.

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 behavior and conscious experience. Fall and spring. King.

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.

122 DEVELOPMENTAL NEUROBIOLOGY (Cell Biology and Anatomy 122) (Physiology 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. Spring. Willard.

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.

181 INFORMATION PROCESSING IN SOMATOSENSORY NERVOUS SYSTEM: EMPIRICAL AND THEORETICAL FOUNDATIONS (BMME 181) (3). Prerequisite, introductory graduate-level course in mammalian physiology, e.g., Phys 140 (may be taken concurrently). This course reviews and discusses (a) the strengths and limitations of the methodologies and approaches that have been used by experimentalists to evaluate information processing and representation in the somatosensory nervous system, and (b) the neural mechanisms currently believed to underlie the somatosensory capacities of humans. Fall. Whitel.

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. Hsiao, 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 201, 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. Dykstra, Light, Lytle, Picker, MacPhail.
210 MEDICAL NEUROBIOLOGY (Physiology 201) (3). Prerequisite, permission of the course director. A special segment 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. Farel, 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.

222 CELLULAR AND MOLECULAR NEUROBIOLOGY I (Biochemistry 222, Pharmacology 222, Physiology 222) (3-5). Prerequisite, permission of the instructor. 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. Stuart and selected faculty.

223 CELLULAR AND MOLECULAR NEUROBIOLOGY II (Biochemistry 223, Pharmacology 223, Physiology 223) (2-3). Prerequisite, permission of the instructor. 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. Stuart and selected faculty.

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 1999 and alternate years. Morell.

259 SEMINAR IN COMPARATIVE ANIMAL BEHAVIOR (Biology 259) (2). Prerequisite, permission of the instructor. Fall or spring. Lobmann, Wiley.

260 SEMINAR IN COMPARATIVE PHYSIOLOGY (Biology 260) (2). Prerequisite, Biology 120 or permission of the instructor. Fall or spring. Staff.

290 SEMINAR IN NEUROBIOLOGY (Biochemistry 290) (2). (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. King.

310 RESEARCH IN NEUROBIOLOGY (Biochemistry 310) (Pharmacology 310) (Physiology 310) (Psychology 310) (Psychology 310) (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, Picker.

394 DOCTORAL DISSERTATION (0 or more). Fall, spring, summer. Research adviser.

400 GENERAL REGISTRATION (0).

SCHOOL OF NURSING

CYNTHIA M. FREUND, Dean
Carol C. Hogue, Associate Dean for Graduate Studies

Professors
Laurel Archer Copp (22) Pain Management
Jo Ann Dalton (23) Oncology, Pain
Molly C. Dougherty
Catherine L. Fogel (4) Health of Women and Children
Cynthia Freund (17) Management; Health Policy and Economics
Sandra G. Funk (32) Research Methodology; Statistics
Jean Goepplinger (92) Community Health
Joanne Harrell (54) Promotion of Cardiovascular Health across the Life Span
Diane Kjervik (103) Aging, Bioethics
Margaret S. Miles (52) Health of Women and Children
Nancy Milo (28) Health Policy; Health Services Research
Merle Mishel (82) Uncertainty in Illness, Instrument Development
Margaret Sandelowski (64) Research Methodology, Women’s Health

Associate Professors
Barbara J. Bunker (15) Adult Critical Care, Trauma and Burns
Margaret E. Campbell (16) Adult and Geriatric Health
Gayle T. Davis, Health of Children
Mary C. Dowe (31) Education; Social and Administrative Services
Anne H. Fishel (2) Community and Mental Health
Barbara Germino (49) Adult Health; Thanatology, Oncology
Edward Halloran (79) Social and Administrative Systems
Carol Hogue (65) Frail Elderly; Quality of Life in Old Age
Diane Holditch-Davis (60) Pediatrics, Neonatology
Margaret F. Hudson (10) Geriatric Health
Mary Lynn (84) Social and Administrative Systems
Shirley Mason (12) Adult and Geriatric Health
Helen M. Murphy (25) Health Policy; Family Health
Virginia J. Neelon (13) Adult and Geriatric Health; Physiology
Susan F. Pierce (26) Administration
Barbara C. Rynerson (19) Community and Mental Health
Ingrid E. Swenson (39) Research Methodology; Epidemiology, Women’s Health

Assistant Professors
Becky Christian (86) Pediatrics
Jennifer D'Auria (85) Pediatrics
Julie Fleury, Acute Care
Rosalie Hammond, Primary Care
Chris McQuiston, Primary Care
Judith Miller
Judith Morrow, Pediatrics
Anne Skelly, Primary Care

Professors Emeriti
Margery A. Duffey
Katherine Nuckolls
Mary Walker Randolph
Marion Woods

**Associate Professors Emeritae**
Audrey J. Booth
Eleanor M. Browning
Bonnie K. Henley
Betty H. Landsberger
Patricia A. Lawrence
Barbara Nettles-Carlson
Marian Smallegan

**MASTER OF SCIENCE IN NURSING**

The School of Nursing offers a curriculum leading to the degree of Master of Science in Nursing. The program of study prepares students for roles in advanced nursing practice. The program requires research, professional and clinical cores, and a selected advanced practice area. Applicants are admitted for either full-time or part-time study and can begin in fall, spring, or summer.

**Program of Study**

Thirty-nine to forty-two hours of credit are required for completion of the program. Nurse practitioner students and Health Care Systems students complete forty-two credits, and clinical nurse specialist students and psychiatric-mental health nurse students complete thirty-nine credits. Students select one advanced practice area: primary care-family nurse practitioner, adult nurse practitioner, neonatal/pediatric nursing, psychiatric/mental health nursing, women's health care nursing, or health care systems.

**Research Core**

NURS 276 RESEARCH METHODS (3). Prerequisite, permission of the instructor. Research process, and interdependence of theory, research, and clinical practice are studied with applications to solving clinical problems and participating as a collaborative member of a research team.

NURS 277 STATISTICS (4). Analysis, interpretation, and reporting of quantitative research data. The student is prepared to move from given research questions/hypotheses to the selection and use of interpretation of statistical analyses.

NURS 392 RESEARCH PROJECT (3-5). Students engage in a research project in collaboration with faculty and under the direction of the thesis option adviser. A scholarly paper is required to reflect project. OR

NURS 393 THESIS (5). 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.

**Professional Core**

NURS 150 ADVANCED PRACTICE ROLES IN THE HEALTH CARE SYSTEM (3). Roles of advanced practice nurses and their opportunities to increase the effectiveness and efficiency of health care are emphasized. Topics include the delivery system, health economics, credentialing, and program development.

NURS 151 HEALTH OF THE PUBLIC (3). Patterns of health and illness emphasizing related conditions among vulnerable groups are examined; implications for preventive health promotion and protective services are analyzed; organization action and policy are studied.

NURS 235 FRAMEWORK FOR NURSING PRACTICE (3). Students will explore the influence of selected theories in nursing and other disciplines on nursing practice and develop a conceptual model for their own practice.

**Clinical Core (not required of Health Care Systems students)**

NURS 200 DEVELOPMENTAL PHYSIOLOGY (3). This course explores developmental changes in morphological processes and normal and abnormal physiology in humans from conception through adolescence.

OR

NURS 230 PATHOPHYSIOLOGY FOR ADVANCED NURSING PRACTICE (3). Physiological and pathophysiological responses to injury-effects on cell function, host defense responses, maintenance of vital functions, and neuro-endocrine-immune responses to stress across the life span are studied.

AND

NURS 229 PHARMACOTHERAPEUTICS IN ADVANCED NURSING PRACTICE (3). Prerequisites, NURS 233, NURS 224 or NURS 226 or permission corequisite with clinical management. Examines principles of pharmacotherapeutic decision making in advanced nursing practice with application to clinical management of common health problems of children and adults across diverse and vulnerable populations.

**Advanced Practice Areas (select one)**

1. Primary Care-Family Nurse Practitioner

   The advanced practice curriculum in Primary Care prepares nurses as family nurse practitioners (FNPs) for community-oriented primary care. Upon completion, graduates are eligible for approval to practice as FNPs in North Carolina and for national certification examinations.

   FNPs provide comprehensive health promotion services to ambulatory clients; evaluate presenting problems at the client's initial contact with the primary care system; and provide continuing care to clients with acute illness and stable chronic illness.

   Themes emphasized throughout the Primary Care courses include: an epidemiologic approach to clinical problems; holism and caring; family and community systems; appropriate use of technology; cost effectiveness; collaboration; consultation and the referral process; theoretical frameworks; and the research base for Primary Care practice.

   Students complete 840 hours of clinical practice with experienced and credentialed preceptors (plus 60 hours of supervised labs), culminating in a capstone practicum in general family practice and a second specialty practicum with a chosen clinical population. A variety of settings are utilized: family practices; health maintenance organizations; student health services; occupational health clinics; home health services; rural clinics; and child, adolescent, adult and geriatric sites. Students participate in preceptor and site selection and often practice in or near their home communities.

   Full-time students can complete the program in four semesters, plus the summer between the first and second years. Part-time students usually complete the program in six semesters plus one summer.
NURS 226 ADVANCED HEALTH ASSESSMENT AND DIAGNOSTIC REASONING IN PRIMARY CARE NURSING (4).
Prerequisite, NURS 230. This course examines the process of diagnostic reasoning as a framework to synthesize comprehensive assessment of patients throughout the life span.

NURS 227 HEALTH PROMOTION IN PRIMARY CARE SETTING (3). This advanced practice nursing course focuses on the role of the primary clinician in promoting health and preventing disease in individuals and families across the life span.

NURS 228 ADVANCED CONCEPTS OF PRIMARY CARE NURSING FOR COMMON ILLNESSES AND CONDITIONS (4).
Prerequisites, NURS 226, NURS 227, corequisite NURS 229. This course examines principles of primary care practice such as assessment, management evaluation, and continuing care of adults and children with common health problems, with clinical application in community-based sites.

NURS 269 ADVANCED CLINICAL PRACTICUM IN COMMUNITY ORIENTED PRIMARY CARE (2).
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 129, NURS 269, NURS 226, NURS 227, NURS 228. This practicum focuses on an ambulatory practice population of interest, defined by specific characteristics such as age, disease, or vulnerability. Clinical management selective students select the classroom portion of another advanced practice area course emphasizing clinical management of particular population of interest, defined by specific characteristics such as age or health/disease state.

2. Adult Nurse Practitioner

The advanced practice track in the Department of Adult and Geriatric Health is designed to prepare nurses as adult nurse practitioners (ANP) with a focus in either cardiovascular health or oncology. Students must complete 720 hours of supervised clinical practice. Graduates of this program will be eligible to sit for the American Nurses’ Association certification examination for ANPs. They will have advanced comprehensive assessment and diagnostic reasoning skills and knowledge and skill in management of health problems common to adults and the elderly.

Students will also develop particular knowledge in prevention and management of adult health problems related to cardiovascular illness or cancer. Graduates will implement and evaluate interventions across settings as well as throughout the trajectories of chronic illness. Their practice will be research based, collaborative, and reflective of understanding of current health care delivery, economic, ethical, and professional issues.

All students will have, in addition to a core course in advanced diagnostic reasoning, two clinical courses that emphasize management of common adult health problems and two that emphasize management of adult health problems related to cardiovascular illness or cancer.

Full-time students can complete the program in four semesters, plus the summer between the first and second years. Part-time students usually complete the program in six to eight semesters.

NURS 256 CLINICAL MANAGEMENT OF COMMON ADULT HEALTH PROBLEMS I (3).
This lecture/seminar/clinical course will provide the initial preparation of advanced practice nurses in the prevention, diagnosis, medical, and nursing management of common adult health problems. Spring.

NURS 256/257 SUMMER PRACTICUM (2).

NURS 257 CLINICAL MANAGEMENT OF COMMON ADULT HEALTH PROBLEMS II (3).
This lecture/seminar/clinical course will establish a framework and knowledge base for advanced practice as an adult nurse practitioner, using research and theory for diagnosis and management of illnesses common to adults and the elderly across multiple settings.

Five credits from the following options are required: NURS 260 and 261 or NURS 222 and 263.

NURS 260 CARE OF ADULTS WITH CARDIOVASCULAR HEALTH PROBLEMS (3).
This course, which combines lecture, seminar, and clinical practice, builds on generalist content with an emphasis on the application and synthesis of specialized knowledge in the assessment and management of acute and chronic cardiovascular disease in adults. Nursing interventions are emphasized as is collaboration with other health professionals and delivery of care across settings.

NURS 261 PRIMARY AND SECONDARY PREVENTION OF CARDIOVASCULAR DISEASE (2).
This course combines seminar and clinical experiences to build on generalist content with an emphasis on the application and synthesis of specialized knowledge targeting primary and secondary prevention in individuals at risk for cardiovascular disease. Particular attention is given to special populations.

NURS 222 ADVANCED ONCOLOGY NURSING PRACTICE: CLINICAL THERAPEUTICS FOR ADVANCED PRACTICE NURSING IN ONCOLOGY (3).
This course combines lecture and clinical experience in a critical examination and application of literature related to principles of care management of persons with cancer and their families across the continuum of care and across settings.

NURS 263 CANCER CONTROL NURSING: PRIMARY AND SECONDARY PREVENTION (2).
This seminar provides for exploration of research literature on risk factors for various cancers and prevention strategies for selected cancers. Clinical experiences facilitate application of knowledge and skills in cancer risk assessment, screening, detection, and prevention. Particular attention is given to aging and minority populations.

3. Neonatal/Pediatric Nursing Track with NNP, PNP and CNS Options

The Neonatal/Pediatric Nursing advanced practice program focuses on the health care of infants, children and adolescents, and their families. This includes an emphasis on both primary care of well and chronically ill children and specialty care of children with complex health or developmental problems or care of critically ill infants.

Students may be prepared as pediatric nurse practitioners (PNPs), neonatal nurse practitioners (NNPs), or clinical nurse specialists (CNSs). PNP students focus on primary care of infants.
or children and complete a minimum of 500 hours of clinical practice in order to be eligible for approval to practice as PNP s in North Carolina and to take certification examinations. NNP students focus on intensive care management of critically ill infants and their families. They complete a minimum of 900 hours of clinical practice in order to be eligible for approval to practice as NNP s in North Carolina and to take certification examinations. CNS students focus on specialty care of children and have the option of selecting electives in nursing management or nursing education.

Each student's program is individualized to the student's interests and needs through clinical placements, papers, presentations, and electives courses. Full-time CNS students can complete the program in four semesters; NNP and PNP students need an additional summer practicum. Part-time students usually complete the program in six semesters.

All students, regardless of the option they select in the Neonatal/Pediatric Nursing advanced practice area, are required to take the following three core courses. Additional courses for the NNP, PNP, and CNS options follow.

**NURS 223 ADVANCED ASSESSMENT AND DIAGNOSTIC REASONING IN NEONATAL AND PEDIATRIC NURSING (3).** This course prepares the advanced practice neonatal/pediatric nurse to comprehensively assess infants and children, using a diagnostic reasoning process and demonstrating an appreciation of cultural diversity. This will include normal infants and children and those with significant medical and/or development problems, including chronic illness.

**NURS 240 NURSING INTERVENTIONS WITH PSYCHOPHYSIOLOGICAL PROBLEMS OF INFANTS AND CHILDREN (3).** This course prepares the advanced neonatal or pediatric nurse to design and implement systems of interventions that promote optimal health and development for children with psychophysiological problems.

**NURS 241 FAMILY RESPONSE TO NEONATAL AND PEDIATRIC HEALTH CARE PROBLEMS (3).** This course focuses on family response 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.

**Neonatal Nurse Practitioner (NNP) Option (8)**

Students who elect the NNP option take eight additional credits of course work as detailed below.

**NURS 258 Management of the Critically Ill Infant (4).** This course prepares the advanced neonatal nurse to manage the high-risk neonate during the critical and convalescent phases of illness and after hospital discharge.

**NURS 262 Externship in the Advanced Nursing Management of the High-Risk Neonate (4).** Intensive practicum in an advanced practice role in a selected health care setting that provides primary or special care to infants, children, or adolescents.

**Pediatric Nurse Practitioner (PNP) Option (8 credits)**

Students who elect the PNP option take eight additional credits of coursework as detailed below.

**NURS 242 ADVANCED CONCEPTS IN AMBULATORY PEDIATRIC NURSING (4).** This course focuses on ambulatory nursing management of children. Content includes health promotion, health maintenance, and common clinical symptomatology/problems in infants, children, and adolescents.

**NURS 244 CLINICAL PRACTICUM IN ADVANCED PEDIATRIC NURSING (1-3).** 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.

An elective in nursing or a related field (3 credits)

**Pediatric Clinical Nurse Specialist (CNS) Option (5 credits)**

Students who elect the CNS option take five additional credits of course work. This must include an elective in nursing management or education (2-3 credits), and either a clinical practicum in Advanced Pediatric Nursing (NURS 244 for 2-3 credits) or another appropriate elective in nursing or a related field (2-3 credits).

4. Psychiatric/Mental Health Nursing

With advanced practice skills gained from master's preparation in the psychiatric-mental health nursing area and American Nurses' Credentialing Center certification as a certified specialist in either adults or children, psychiatric-mental health nurses can function as psychotherapists and case managers in a variety of public, private, community, inpatient, and collaborative practice settings, or as consultants for hospitals and community organizations. Following completion of the program, and after meeting the required number of supervised practice hours, nurses can sit for the ANCC certification examination in Advanced Practice of Psychiatric-Mental Health Nursing for either adults or children and adolescents.

The psychiatric-mental health advanced practice nurse has many opportunities in today's changing health care system. In the next decade the master's degree increasingly will be required for the most rewarding careers in psychiatric-mental health nursing.

The goal is to prepare clinicians who can manage independently the mental health care needs of clients. Course work includes the professional core of nursing such as advanced practice roles and research, and builds on the clinical core of pathophysiology and pharmacotherapeutics. All of the specialty area courses contain both seminar and clinical practicum components. The specialty area focus is on diagnostic reasoning; interventions for individuals, families, and groups; underserved populations.

Full-time students can complete the program in four semesters, plus the summer between the first and second years. Part-time students usually complete the program in six to eight semesters.

**NURS 224 ADVANCED DIAGNOSTIC PROCESS IN PSYCHIATRIC/MENTAL HEALTH NURSING (3).** In advanced practice psychiatric/mental health nursing, the reasoning process for determining medical and nursing diagnoses is examined. Models for assessment, intervention, and evaluation are explored and tested clinically.
NURS 246 PSYCHIATRIC NURSING INTERVENTIONS WITH INDIVIDUALS (3). Prerequisite, NURS 224. Analyze theories, techniques, and research relevant to individual therapy. Experience with selected theories will be provided in clinical practice.

NURS 247 PSYCHIATRIC/MENTAL HEALTH NURSING INTERVENTIONS FOR FAMILIES AND GROUPS (3). Students will analyze theories, techniques, and research relevant to therapy with families and groups experiencing mental health problems. Applications of traditional and contemporary models to nursing practice. Models are emphasized.

NURS 248 PSYCHIATRIC-MENTAL HEALTH NURSING FOR UNDERSERVED POPULATIONS (3). Prerequisite, NURS 224. Uses epidemiology, psychoeducation, clinical case management, and health policy to examine the scope of mental health problems and services for underserved populations. Model programs and mental health policies are critiqued.

NURS 271 PSYCHOPHARMACOLOGY FOR ADVANCED PRACTICE PSYCHIATRIC-MENTAL HEALTH NURSES (2-3). Prerequisites, NURS 224, NURS 229. Application of concepts from the psychobiological sciences to the prescriptive practice of psychotropic medications, with experiences to guide in making independent assessments about medication management.

or

Elective of student's choice (2 credits)

Many students take electives in nursing and in other disciplines such as physiology, immunology, biologic psychology, health law, ethics, and health policy. Popular elective options for psychiatric-mental health nurses include psychology, social work, anthropology, and nursing courses in pain or death and dying.

5. Women's Health Nursing Track with WHCNP and CNS Options

The advanced practice track in Women's Health Nursing focuses on the care of women from adolescence through old age who are experiencing a wide range of health and illness conditions or encountering life crises and transitions. Students are prepared as clinical nurse specialists (CNS) or women's health care nurse practitioners (WHCNP). WHCNP students complete a minimum of 600 hours of clinical practice with experienced and credentialed preceptors in order to be eligible for certification examinations.

Full-time students can complete the program in four semesters and the summer after the second year. Part-time students usually complete the program in six semesters plus a practicum the following summer.

All students, regardless of the option they select in the Women's Health Care Nursing advanced practice area, are required to take the following two core courses. Additional courses for the WHCNP and CNS options follow.

NURS 251 CARE OF WOMEN IN CHILDBEARING YEARS (4). Students focus on the care of women of childbearing age, examining current trends in practice and relevant research findings. Students explore contraceptive control, conceptus control, and prenatal and postpartal management. Emphasis is placed on developing: 1) a theoretical basis for practice; and 2) proficiency in assessment, counseling, education, and problem management with women of childbearing age.

NURS 253 COMMON HEALTH NEEDS AND PROBLEMS OF WOMEN (4). This course focuses on common health problems of women throughout the life cycle. Emphasis is placed on assessment, management, and critical decision making. Current trends in practice and research findings in the management of healthy women are analyzed and evaluated. Strategies for assessing, interviewing, and providing care in ambulatory care settings are provided.

Women's Health Nurse Practitioner (WHCNP) Option

Students who elect the WHCNP option take nine additional credits of course work as detailed below. Students completing this option are eligible to apply for approval to practice as a WHCNP in the state of North Carolina and to sit for national WHCNP certification examinations.

NURS 226 ADVANCED HEALTH ASSESSMENT AND DIAGNOSTIC REASONING IN PRIMARY CARE NURSING (4).

NURS 228 ADVANCED CONCEPTS OF PRIMARY CARE NURSING FOR COMMON ILLNESS AND CONDITIONS (3).

NURS 254 HEALTH CARE IN WOMEN, PRACTICUM (1-5).

This course gives the student a concentrated, experiential opportunity to provide advanced practice nursing in selected areas of women's health.

Clinical Nurse Specialist (CNS) Option

Students who elect the CNS option take six additional credits of course work. This includes a three-credit clinical nursing elective from another advanced practice area, and any other three-credit elective. Course selections are individualized for students based on their experience, clinical interests, and career goals. With appropriate planning of course selections, students completing this option are eligible to sit for selected national certification examinations.

6. Health Care Systems

The ever dynamic health care delivery system requires new skills of administrative and clinical nursing leaders. The graduate program in Health Care Systems focuses on the knowledge and skills needed to succeed in a variety of leadership positions in evolving health care organizations. It includes content in nursing administration, management, leadership, informatics, finance, quality, and managed care/case management strategies. Such an approach will result in nurses prepared to develop, implement, and measure the impact of innovations in care delivery at all levels within health care organizations.

Students may specialize in one of three areas: administration, case management, or informatics. Each option requires the same five core courses in Health Care Systems; in the area of specialization the student takes one required course, one elective, and a residency which involves 200 hours in selected clinical sites with experienced, masters-prepared nurses.

Upon completion of the program and with the requisite experience, students will be eligible to sit for the certification examination of the American Nurses Credentialing Center in Nursing Administration or Nursing Informatics.

Normally, full-time students can complete the program in
four semesters. Part-time students may complete the program in three to five years.

All students, regardless of the option they select in the Health Care Systems advanced practice area, are required to take the following five core courses and the residency (for a total of eighteen credits). Additional courses for each of the three specialty options follow. The faculty is committed to the student's learning needs by employing a variety of instructional modalities including seminar or classroom settings and videocase and online (Internet) instruction. As a result, the following courses may be offered using traditional classroom settings and/or distance technologies, allowing students to take modules of one or more credits at a time.

NURS 116 MANAGED CARE AND CASE MANAGEMENT (1-3). Explores the theoretical, contextual, and practical elements of managed care and case management across the continuum of care. Includes care maps, DRGs, and the tools used in managed care.

NURS 117 HEALTH CARE INFORMATICS (1-3). Develops an understanding of the concepts relevant to health care informatics and the use of computerized information systems in health care organizations and the use of computer applications to support clinical and administrative decision making.

NURS 236 LEADERSHIP IN ORGANIZATIONS (1-3). 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 (1-3). Explores the knowledge and skills required for effective human resource management. Managerial behaviors that promote and maintain a professional nursing practice environment will be emphasized. Includes a 60-hour practicum in the specialty area.

NURS 238 FINANCIAL MANAGEMENT (1-3): Examines issues related to health care economics, financial management, and budgeting, to facilitate managerial decision making. Includes a 60-hour practicum in the specialty area.

NURS 243 NURSING MANAGEMENT RESIDENCY (1-2). 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. During the residency, students participate in twelve hours of integrative seminar discussions evaluating the interpersonal relationship between nurse managerial leadership, nursing care delivery systems, clinical nursing effectiveness, and clinical outcomes.

Administration Option (6 credits)

Students who elect the administration option take six additional credits of course work as detailed below.

Three credits from the following courses:

BA 257 HUMAN RESOURCE MANAGEMENT (1.5). How strategic human resource management can contribute to organizational effectiveness. Emphasis will be placed on how the manager can effectively manage human assets or constructively influence the organization's human resources function. Some of the human resources issues to be considered include recruitment and selection, diversity, performance evaluation, compensation and reward systems, teams, worker participation, family-friendly programs, and a variety of ethical issues.

BA 299 QUALITY, OPERATIONAL EXCELLENCE, AND CUSTOMER VALUE AND PROCESS IMPROVEMENT PROJECT (3). Explores the ideas underlying systematic improvement of customer value: Total Quality Management, re-engineering, or operational excellence. How organizations integrate their approach to improving quality, processes, and customer value with other management activities to achieve systematic improvement of business performance. Includes work in small teams on improvement project.

HPAA 250 INTRODUCTION TO HEALTH CARE FINANCIAL MANAGEMENT (3). 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.

Three credits from the following electives:

BA 259 POWER, POLITICS AND LEADERSHIP (1.5). Study of how power is used within organizations. Examines the major advanced leadership issues dealing with managing a boss, managerial sabotage, managerial succession, changing difficult subordinates, gaining promotions, office politics, how to manage a successful career and life.

BA 253 NEGOTIATIONS (1.5) Improve students' skills in all aspects of negotiation including preparing for negotiations, listening for others' needs, generating creative resolutions, know when and how to use a win-lose approach, proposing settlements, and closing negotiations.

HPAA 138 CONFLICT RESOLUTION AND NEGOTIATION FOR MANAGERS (3). Conflict resolution and negotiating skills for health care administrators. Listening, assertion, negotiation, and mediation.

HPAA 139 DEVELOPMENT OF PERSONAL EFFECTIVENESS (3). Prerequisite, permission of the instructor. Based on the assumption that personal effectiveness depends on being able to think clearly, this course encourages the development of rational thinking through understanding the relationship between thinking and feelings.

HPAA 180 HEALTH LAW (3). The law and the legal decision making processes and their relationship to the delivery of health services.

HPAA 221 ORGANIZATION AND ADMINISTRATION OF MULTIHOSPITAL SYSTEMS (3). 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.

HPAA 223 MANAGEMENT OF ORGANIZATIONAL CHANGE (3). The objective of this course is to improve competence in analyzing health organizations and managing planned change.

HPAA 250 INTRODUCTION TO HEALTH CARE FINANCIAL MANAGEMENT (3). 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.

HPAA 252 LONG-TERM FINANCIAL MANAGEMENT OF HEALTHCARE ORGANIZATIONS (3). Advanced financial management concepts and practices in health service organizations, including: working capital management, capital markets, capital structure, capital budgeting, and reimbursement implications.

Case Management Option (6 credits)

Students who elect the Case Management option take six additional credits of course work as detailed on the next page.
Three credits from the following courses:

HPAA 140 READING IN HEALTH POLICY AND ADMINISTRATION (1-3). Courses, which are developed by the professor on a semester by semester basis, must be approved by the School of Nursing faculty advisor or department chair.

HPAA 263 QUALITY AND UTILIZATION MANAGEMENT (3). Evolution and current status of health care quality management systems and programs for utilization control. Includes discussion of alternative quality assurance methods; hospital accreditation; government programs.

RHAB 216 REHABILITATION COMMUNITY ORGANIZATION (3). Introduction to community-based treatment facilities and programs, the identification of rehabilitation community organization, structural, political, and economic.

Three credits (theory portion only of a clinical elective) selected from the curriculum of another advanced practice area in the School of Nursing. There are a diversity of courses that can link with a student's program and career interests; faculty advisors will work with the individual student to identify courses that will enhance the student's ability in a chosen field, given a student's career interests and background.

Informatics Option (6 credits)

Students who elect the informatics option take six additional credits of coursework as detailed below.

One of the following two courses:

INLS 150 ORGANIZATION OF INFORMATION (3). Introduction to the problems and methods of organizing information, including information structures, knowledge schemas, data structures, terminological control, index language functions, and implications for searching.

INLS 162 SYSTEMS ANALYSIS (3). Introduction to the systems approach to the design and development of information systems. Methods and tools for the analysis and modeling of system functionality (e.g., structured analysis) and data represented in the system (e.g., object-oriented analysis) are studied.

One of the following electives:

INLS 172 INFORMATION RETRIEVAL (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.


INLS 181 INTERNET APPLICATIONS (3). 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.

INLS 182 INTRODUCTION TO LOCAL AREA NETWORKS (3). Introduction to local area network hardware, topologies, operating systems, and applications. Also discusses LAN management and the role of the network administrator.

INLS 203 INFORMATION SYSTEMS EFFECTIVENESS (3). 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 are considered.

INLS 256 DATABASE SYSTEMS (3). A study of database models including relational, hierarchical, and network; normalization techniques, query languages and entity-relationship theory.

INLS 257 USER INTERFACE DESIGN (3). 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.

INLS 263 KNOWLEDGE-BASED SYSTEMS (3). Design of systems offering a knowledge-base in support of task requirements or that model expertise. Knowledge acquisition and representation approaches are applied in the systems development process.

BUSI 192 INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS (3). A survey of the elements and functions of management information systems and the principles underlying the design and management of effective systems.

EDEO 190 EDUCATIONAL APPLICATIONS OF MICROCOMPUTERS (3). An introduction to educational applications of microcomputers, including introductory BASIC programming and an overview of CAI, CMI, word processing, software evaluation, and teacher utility programs. As demand warrants.

Supporting Electives

The School of Nursing offers the following graduate electives in nursing in either fall or spring.

NURS 113, 114 SPECIAL PROBLEMS (2-6). These courses are available to advanced undergraduate and graduate 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 176 WOMEN OVER FIFTY IN CONTEMPORARY SOCIETY (3). Permission of the instructor required. Students view the population group of women over fifty from several perspectives: sociological, economic, political, and psychological—looking at their health and their role in family, work, and community.

NURS 181 PAIN COPING, PAIN MANAGEMENT, AND THE PAIN EXPERIENCE (2). Students learn to take a history, attend to pain cues, pain assessment, and nursing interventions. Topics include coping strategies, ethics and pharmacological approaches, and the literature of pain.

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 201 CARE OF ADULTS WITH CARDIOVASCULAR HEALTH PROBLEMS (2-3). Reviews cardiovascular health problems of adults and seniors. Analyzes related medical and nursing care needs. Emphasis on pathophysiology, research, prevention, and advanced nursing role.

NURS 202 THE ETHIC OF CARE AND NURSING (3). This seminar analyzes theories of an ethic of care, examines concepts of care in nursing, and evaluates the relevance, strengths, and limits of the ethic of care for nursing.
NURS 204 SCIENTIFIC WRITING (3). This course focuses on the principles and practice of scientific writing, with emphasis on research proposals, 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.

NURS 291 CURRICULA IN NURSING (3). This course focuses on the structure of the discipline of nursing as a basis for curriculum development and evaluation.

NURS 306 PRACTICUM IN CURRICULUM AND INSTRUCTION (3). Students demonstrate proficiency in teaching by working with and delivering instruction with a selected preceptor in one’s specialty. An integrative seminar is conducted.

NURS 356 CURRENT ISSUES IN HEALTH POLICY AND MASS COMMUNICATIONS (2-3). Permission of the instructor. Provides an analytic skill in a real-world context for those who will participate in the broad process of policy formulation through their positions in the health professions and mass communications field.

Admission Requirements

- Registered nurses must have graduated from an NLN accredited baccalaureate nursing program, or must fulfill the prerequisite courses for the RN-MSN option which is available for registered nurses without a bachelor's degree or with a bachelor's degree in a field other than nursing. Information on the RN-MSN Option can be obtained from the Office of Student Services.
- Applicants must have a strong overall academic record with an average of B or better in nursing courses and during the last two years of undergraduate work.
- Applicants must have competitive GRE scores.
- A minimum of one year of work experience as an RN is required. In some advanced practice areas work experience in that practice area is required.
- An introductory statistics course is required.
- A health assessment course, approved by the school, within the past two years is required of all applicants with the exception of Health Care Systems.
- RN licensure to practice nursing in the state of North Carolina is required for enrollment.

Degree Requirements

To be eligible for the Master of Science degree in Nursing, a candidate must meet the following requirements:

- Remove any provisions of the original admission to the Graduate School.
- Complete the degree within five years.
- Complete required semester hours of graduate credit removing any temporary grades (incompletes, absences, no reports, and S grades on all course work with the exception of the thesis, NURS 393); register for NURS 392 (for at least three hours) if electing to do a project or NURS 393 (for at least five hours) if electing to do a thesis; and have transfer credit approved by the Graduate School.
- Pass the comprehensive examination.
- Submit the thesis or research project paper.
- Present an oral defense of thesis/project.

Doctoral Philosophy in Nursing

The discipline of nursing is concerned with health-related human responses and nursing interventions that protect and promote health, facilitate recovery from illness, and stimulate adaptive responses to illness and disability. The Ph.D. in Nursing program at The University of North Carolina at Chapel Hill prepares researchers and clinical scholars who will expand the body of knowledge in the discipline and the scientific bases for nursing practice.

As the twenty-first century approaches, preventing and managing chronic health problems have become key focuses of nursing. While the scholarship of the faculty of the School of Nursing is wide ranging, faculty have adopted as a priority for research and clinical scholarship the prevention and management of chronic health problems across the life span and in vulnerable populations at risk for developing or having difficulty managing chronic health problems. Prevention of chronic health problems involves not only health promotion and disease prevention in well populations, but also management of acute conditions to prevent chronic complications. Management of chronic health problems involves helping people manage both physiological and psychosocial stresses that may lead to diminished health or ability to function.

The UNC program gives particular emphasis to vulnerable populations and to developmental and other transitions that increase the risk of developing or worsening a chronic condition. Faculty research focuses on identification of populations at greatest and on natural or social risk factors amenable to change; interventions that specify the nature of treatable conditions, actions to attain the expected effects, the steps involved in the process, and anticipated outcomes; and the measurement of desired outcomes, interactions, or contingencies among the outcomes, and other factors affecting outcomes, including policy making and strategic organizational planning.

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, its prevention and management, and its impacts on human and economic resources. Methodological course work includes quantitative and qualitative research methods, statistics, 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, populations 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 health 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 administration, 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. Quantitative 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.

**NURS 380 INDEPENDENT STUDY (Var.).**

**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 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 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. (On request.) 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 384 PROSEMINAR IN NURSING (A, B, C, D, OR E) (1-3).** Proseminars are offered for 1, 2, or 3 credits. Specific topics within a proseminar for each semester are selected from the list below by the Doctoral Executive Committee in September of the preceding year:

**NURS 384A Proseminar in Nursing: Individual Responses in Health and Illness.** Examination of theory and research related to individual responses in health or illness. (Alternate years.) Staff.

**NURS 384B Proseminar in Nursing: Nursing of Communities and Organizations.** In-depth examination of theory and research to selected aspects of nursing care for communities and/or organizations. (Alternate years.) Staff.

**NURS 384C Proseminar in Nursing: Environments and Health.** Examines theory related to aspects of environments and health.

**NURS 384D Proseminar in Nursing: Therapeutics.** Examines theory and research related to specific aspects of nursing interventions. (Alternate years.) Staff.

**NURS 384E Proseminar in Nursing: Special Topics in Research Methods.**

**DISSERTATION REGISTRATION (At least 3).**

**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 advisor and the associate dean of graduate studies in nursing and the one or more other departments selected for study.

**Elective Courses**

**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 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 300 SPECIAL TOPICS IN NURSING (3).** The study of special topics directed by an authority in the field.
NURS 310 INFANTS AND CHILDREN: PREDICTION, PREVENTION, AND AMELIORATION (3). Examines assessment and interventions for developmental delay or health problems in infants and children. Models, research are critiqued.

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). See above.

NURS 337 DESIGNING INTERVENTION STUDIES (3). Examination of methodological, ethical, and practical issues in the design and implementation of theory-based intervention studies. (Alternate years.) Staff.

NURS 351 NURSING SYSTEMS: MEASUREMENT ISSUES (3). Addresses measurement issues in nursing systems research, using secondary data, quantitative and qualitative methods. Types of measures include patient, professional, and organizational.

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). Directs students to develop research skills related to dissertation and future research.

The Division of Occupational Science in the Department of Medical Allied Health Professions offers a graduate program leading to the Master of Science degree with a major in Occupational Therapy. This is a two-year, two-month 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 scores from the Graduate Record Examination.
3. Academic record that demonstrates potential to do work at the graduate level.

The division requires each applicant to complete its application packet.

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-six semester credit hours. The program is twenty-six months in length and includes substantial fieldwork experience.

Occupational Science courses are available to graduate students enrolled in the OT program at the University.

Courses for Graduates

206 FOUNDATIONS OF OCCUPATIONAL THERAPY AND OCCUPATIONAL SCIENCE (3). Foundation concepts introduced as a prelude to in-depth study: occupational science; professionalism in occupational therapy; human occupation, occupation as a medium for change, critical thinking styles. Summer. Nielson.

207 OCCUPATIONAL THERAPY PRACTICE ENVIRONMENTS (1). Overview of practice environments for OT. Factors that influence practice in various settings, such as legislative, confidentiality, ethics, reimbursement, and rural practice. Elements of professionalism in clinical 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. Taylor.

226 OCCUPATIONAL AND ENVIRONMENTAL TRANSFORMATIONS I (3). Continuity and changes in pattern, function and meaning of occupations from early adulthood through old age. Sources of individual differences in occupation within family, SES, and cultural contexts examined. Fall. Humphry.

242 APPLICATION OF TECHNOLOGY TO OCCUPATIONAL THERAPY (1). An overview of the use of technology in occupational therapy practice. Spring. Staff.


284 OCCUPATIONAL THERAPY AND CHILDREN II (2). Prerequisite, OCCT 282. Theory and application of therapeutic procedures to provide services for special-need children in school and community. Spring. Baranek.

304 RESEARCH DESIGN AND STATISTICS IN OCCUPATIONAL THERAPY (3). Review of elementary statistics; focus on a variety of research designs and methodologies; experience in the development of research questions, literature review, and proposal development. Fall. Wood.

306 CASE STUDY (1). Prerequisites, OCCT 300, 302. Case method used to develop understanding of interdisciplinary teamwork and related discipline's roles in evaluation and treatment. Spring. Nielson.

320A FIELDWORK II (6). Direct experience with clients/patients in varied service treatment settings. Experience will include adult disabilities (A) Sumner. Coppola.

320B FIELDWORK EXPERIENCE IN OCCUPATIONAL THERAPY (6). Prerequisite for OCCT 320B is OCCT 320A. Direct experience with clients/patients in varied service and treatment settings. May be repeated for credit. Summer, spring, fall. Coppola.

330 APPLIED RESEARCH IN OCCUPATIONAL THERAPY (3). Prerequisite, OCCT 304. Collaborative research project in occupational therapy. Emphasis on data collection, data input and analysis, writing and presenting results, application of findings to theory and clinical practice. Spring. Staff.

340 PROFESSIONAL ISSUES IN OCCUPATIONAL THERAPY (1). Seminar discussions on selected issues and problems related to occupational therapy. Spring. Wood.

350 INDEPENDENT STUDY: SPECIAL TOPICS IN OCCUPATIONAL THERAPY (1-3). Elective. Independent study to pursue specific interests and topics. Faculty supervision. May be repeated for credit. Fall, spring, summer. Staff.

360 THEORY-BASED PRACTICE IN OCCUPATIONAL THERAPY (1). Prerequisites, OCCT 160 and 320A. Review of the multiple theories underlying occupational therapy and program development; integration of theory and program planning models. Spring. Nielson.

393 THESIS (3). Elective. Independent research project in occupational therapy. Faculty supervision. May be repeated for credit. Fall, spring, summer. Staff.

DEPARTMENT OF OPERATIONS RESEARCH

J. SCOTT PROVAN, Chair

Professors
*George S. Fishman (10) Simulation Methodology, Network Reliability
*Vidyadhar G. Kulkarni (16) Stochastic Models
*J. Scott Provan (20) Networks, Computational Complexity, Combinatorial Optimization
David S. Rubin (3) Integer Programming, Networks
*Shaler Stidham Jr. (21) Stochastic Processes, Control of Queues, Queueing Theory, Markov Decision Processes
*Jon W. Tolle (6) Optimization Theory
Harvey M. Wagner (19) Management, Strategic Thinking, Modeling

Associate Professor
*Mark E. Hartmann (22) Combinatorial Optimization, Integer Programming, Polyhedral Combinatorics

Adjunct Associate Professor
Joseph B. Mazzola (23) Combinatorial Optimization, Applied Mathematical Programming, Production Planning and Scheduling

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 forty 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

* core faculty members
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 mathematical background including courses in advanced calculus, linear or matrix algebra, 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 courses, 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 World Wide Web home page (www.or.unc.edu), 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@or.unc.edu.

Courses for Graduates and Advanced Undergraduates

140 MATHEMATICAL MODELS FOR DECISION MAKING (3).
Prerequisite, MATH 181. 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.

181 DETERMINISTIC MODELS IN OPERATIONS RESEARCH (Mathematics 151) (Statistics 181) (3).
Prerequisite, Mathematics 147. Linear, integer, nonlinear and dynamic programming, classical optimization problems, network theory. Fall. Hartmann, Provan, Tolle.

183 STOCHASTIC MODELS IN OPERATIONS RESEARCH (3).
Prerequisite, BIOS 160 or STAT 126. Introduction to Markov chains, Poisson process, continuous-time Markov chains, renewal theory. Applications to queueing systems, inventory, and reliability, with emphasis on systems modeling, design, and control. Spring. Hartmann, Kulkarni, Stidham.

190 COMPUTATIONAL MATHEMATICS FOR DECISION SCIENCES (3).
Prerequisite, permission of the instructor. Reviews basic mathematical and computational theory required for analyzing models that arise in operations research, management science, and other policy sciences. Solution techniques that integrate existing software into student-written computer programs will be emphasized. Fall.

Courses for Graduates

210 MODELS IN OPERATIONS RESEARCH (3).
Prerequisites, calculus, linear or matrix algebra. Formulation, solution techniques, and sensitivity analysis for optimization problems which can be modeled as linear, integer, network flow, and dynamic programs. Use of software packages to solve linear, integer, and network problems. Fall. Hartmann, Rubin, Wagner.

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 programming. Basic optimality conditions, convexity, duality, sensitivity analysis, cutting planes, and Kuhn-Kantor conditions. Spring. Hartmann, Provan, Rubin.

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 specially structured problems. Spring. Tolle.

213 MATHEMATICAL PROGRAMMING II (3).
Prerequisite, OR 212 or permission 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 combinatorial optimization problems. Topics include enumerative and cutting plane methods, Lagrangian relaxation, Benders' decomposition, knapsack problems, and matching and covering problems. (Alternate years.) Hartmann, 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 algorithms; combinatorial and scheduling applications. Spring. Hartmann, Provan.

216 TOPICS IN DISCRETE OPTIMIZATION (3).
Prerequisites, OR 212 and permission of the instructor. Topics may include polynomial algorithms, computational complexity, matching and matroid problems, and the traveling salesman problem. (Alternate years.) Hartmann, Provan.

217 COMPUTATIONAL METHODS IN MATHEMATICAL PROGRAMMING (3).
Prerequisites, OR 212 and permission of the instructor. Advanced topics such as interior point methods, parallel algorithms, branch and cut methods, and subgradient optimization. (Alternate years.) Hartmann, Provan.

220 STOCHASTIC MODELS IN OPERATIONS RESEARCH I (3).


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.


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.

MONTE CARLO METHODS (3). Prerequisites, STAT 127 or STAT 135 and OR 220 or STAT 129. Monte Carlo sampling approach to evaluation. Sampling plan design, accuracy estimation, efficiency-improving techniques, best-case and worst-case required sample sizes, Markov-chain sampling. Spring. Fishman.

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.

DECISION THEORY (3). Prerequisite, OR 210 or equivalent. Axiomatic development of subjective probability and utility theory. Introduction to decision analysis, statistical decision theory, and game theory. (On demand.)

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.)

DIRECTED READING IN OPERATIONS RESEARCH AND SYSTEMS ANALYSIS (Variable). Prerequisite, permission of Operations Research faculty member. Fall and spring. Staff.

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.

SPECIAL TOPICS IN OPERATIONS RESEARCH AND SYSTEMS ANALYSIS (Variable). Prerequisite, permission of the instructor. Fall and spring. Staff.

OPERATIONS RESEARCH AND SYSTEMS ANALYSIS STUDENT SEMINAR (1). Survey of literature in operations research and systems analysis. Spring. Staff.

MASTER'S THESIS (3 or more). Prerequisite, permission of the student's adviser. Fall. Staff.

DOCTORAL DISSERTATION (3 or more). Prerequisite, permission of the student's adviser. Fall and spring. Staff.

GENERAL REGISTRATION (0).

DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE

JOE W. GRISHAM, Chair
James D. Folds, Vice Chair, Clinical Services
J. Charles Jennette, Vice Chair, Academic Programs

Professors
Nadia Malouf Anderson (26) Regulation of Striated Muscle Protein Expression in Development and Disease
Dwight A. Bellinger (89) Laboratory Animal Medicine, Thrombosis and Atherosclerosis
Stuart A. Bentley (88) Hematopathology, Regulation of Hemopoiesis, Hematopoietic Microenvironment
Thomas W. Bouldin (72) Neuropathology, Ocular Pathology, Neurototoxicology
John F. Chapman Jr. (79) Clinical Chemistry, Automation in Laboratory Medicine, Fetal Lung Maturity
Herbert A. Cooper (154) Experimental Pathology, Hemophilia
Robert E. Cross (46) Clinical Chemistry, Toxicology, Clinical Pharmacology
Rosann A. Farber (118) Human Molecular Genetics, Cancer Genetics, Somatic Cell Genetics
James D. Folds (155) Immunophenotyping of Human Lymphocytes, Flow Cytometry
Donald T. Forman (59) Clinical Chemistry, Alcohol Metabolism, Pediatric Metabolic Diseases
Thomas R. Griggs (50) Blood Coagulation, Atherosclerosis
Joe W. Grisham (1) General and Experimental Pathology, Cell Cycle Regulation, Mechanisms of Carcinogenesis
John E. Hammond (47) Application of Information Management Tools to Problems in Pathology and Medicine
J. Charles Jennette (61) Renal Pathology, Immunopathology
David G. Kaufman (34) Molecular and Cellular Biology of Chemical Carcinogenesis
Susan T. Lord (94) Macromolecular Structure/Function, Molecular Genetics of Fibrinogen
Nobuyo Maeda (116) Animal Model and Atherosclerosis, Molecular Genetics, Molecular Evolution
Howard M. Reiner (38) Immunogenetics of Blood Coagulation, Vasculitides, Immunochemistry
Harold R. Roberts (15) Thrombosis and Hemostasis, Molecular Biology of Blood Clotting Factors
Lawrence M. Silverman (73) Molecular Pathology/Genetics
Gary J. Smith (85) Carcinogenesis, Aging, Microenvironmental Effects on Tumorigenicity
Oliver Smithies (115) Targeted Homologous Recombination, Animal Models of Human Genetic Disease, Gene Therapy
Darrel W. Stafford (127) Molecular Biology
Kinuko I. Suzuki (110) Neuropathology, Genetic Neurological Disorders, Cellular Reaction to Neural Injury and Metabolic Derangement
James A. Swenberg (66) Chemical Carcinogenesis, DNA Adducts and Repair, Cell Proliferation, Molecular Toxicology
Richard R. Tidwell (42) Antiviral/Antimicrobial Agents, Protease Inhibitors, DNA-Directed Enzymes, Opportunistic Infections
Michael D. Topal (41) Molecular Biology, Protein DNA Interaction, DNA Recognition
Bernard E. Weissman (119) Regulation of Tumorigenesis and Differentiation, Tumor Suppressor Genes

**Associate Professors**
Mark E. Brecher (128) Blood Component Processing and Storage, Transfusion Strategies, Bacterial Contamination of Blood
Frank C. Church (107) Macromolecular Structure-Function, Thrombosis and Hemostasis, Wound Healing and Tumor Cell Invasion
Myra L. Collins (97) Transfusion Medicine, Philosophy of Disease
Marita Cordeiro-Stone (96) DNA Replication and Repair, Mechanisms of Chemical Carcinogenesis
Georgette A. Dent (117) Hematopathology, Surgical Pathology, Molecular Pathology
Cor-Jean S. Edgell (84) Somatic Cell and Molecular Genetics of Endothelium
William K. Kaufmann (95) DNA Metabolism, Cell Cycle Control, Chemical and Radiation Carcinogenesis
Susan J. Maygard (131) Cytopathology, Fine Needle Aspirations, Prostate Carcinogenesis
Katherine B. Prywansky (86) Leukocyte Biology, Hematopathology, Immunopathology
Timothy C. Nichols (156) General Cardiology, Cardiac Catheterization
John T. Wooley (133) Dermatopathology, Gastrointestinal Pathology, Hepatobiliary Pathology

**Assistant Professors**
Mary V. Allen (153) Cytopathology, Breast Pathology
Nicholas Bandarenko III (149) Therapeutic Apheresis
William B. Coleman (139) Hepatocarcinogenesis, Tumor Suppressor Genes, Biology of Liver Stem Cells
William K. Funkhouser Jr. (152) Autoimmunity, Transplant Rejection
Joseph Geradts (130) Molecular Pathology of Solid Tumors, Emphasis on Breast Cancer, Molecular Techniques in Surgical Pathology
Diane M. Maia (138) Surgical Pathology, Hematopathology, Pediatric Pathology
Debra B. Novotny (132) Cytopathology, Fine Needle Aspiration Biopsy, Gynecological Pathology

**Clinical Professors**
William H. Anderson (151) Forensic Toxicology
John D. Butts (70) Forensic Pathology, Injury Prevention
Robert L. Thompson (100) Forensic Pathology

**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**
Lanier H. Ayres (146) Drug Resistance in Leukemia
Karen E. Chancellor (147) Forensic Pathology, Neuropathology
Elizabeth M. Rohlf (158) Molecular Pathology

**Research Professor**
Marjorie S. Read (106) Platelets, Thrombosis, and Hemostasis

**Research Associate Professors**
Virginia L. Godfrey (148) Veterinary Pathology, Animal Models of Disease
Christian E. Newcomer (136) Comparative Medicine and Pathology
Clifford A. Rinnehart Jr. (123) Hormonal Carcinogenesis, Molecular Biology of Aging and Immortalization

**Research Assistant Professors**
Hyung-Suk Kim (137) Animal Models for Hypertension and Stroke, Gene Regulations in Control of Blood Pressure
Laura H. Reid (145) Tumor Suppressor Genes and Genome Research

**Adjunct Professors**
J. Carl Barrett (75) Chemical and Environmental Carcinogenesis, Mutagenesis of Mammalian Cells in Culture
Byron Butterworth (67) Genetic Toxicology, Chemical Carcinogenesis
Robert R. Maronpot (140) Mechanisms of Carcinogenesis
Stephen C. Nesson (39) Chemical Carcinogenesis, Environmental Toxicology
Paul Nettesheim (65) Pulmonary Function and Toxicology

**Adjunct Associate Professors**
Gary A. Boorman (102) Toxicological Pathology, Myelotoxicology
Marc J. Mau (104) Respiratory Carcinogenesis, Carcinogen Metabolism
Kevin T. Morgan (103) Nasal Toxicology
Roger W. Wiseman (141) Molecular Genetics and Carcinogenesis

**Adjunct Assistant Professors**
Russell C. Cattley (142) Chemical Carcinogenesis and Toxicologic Pathology
Thomas L. Goldsworthy (143) Mechanism of Chemical Carcinogenesis
Richard S. Paules (144) Oncogenes Tumor Suppressor Genes and Cell Cycle Control in Neoplastic Transformation of Mammalian Cells

**Professors Emeriti**
Kenneth M. Brinkhouse
Frederic G. Daldorf
J. Dieter Geratz
John B. Graham
William D. Huffines
Robert D. Langdell
William W. McLendon
Richard W. Shermer
Robert H. Wagner

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 Master of Science and Doctor of Philosophy degrees. Participation in research activities leading to an original thesis (M.S.) or dissertation (Ph.D.) 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

134 BIOLOGY OF BLOOD DISEASES (BIOL 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, hemophilies, thrombophilies, 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.

161S 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.

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, one previous course in genetics and permission of the instructor. Topics in human genetics including molecular genetics, special methods used in human genetics research, and molecular genetic principles learned from studies of humans. Three lecture hours a week. Spring. (1998 and alternate years.) Farber.

178 HUMAN DNA METABOLISM (2). Prerequisite, a basic biochemistry course. This course examines the molecular biology of DNA replication, recombination, repair, and recombination as these processes occur in human cells. Two seminar hours per week. Spring. (1999 and alternate years.) Kaufmann.

214 ETIOLOGY AND PATHOGENESIS OF HUMAN DISEASE (3). Prerequisites, Pathology 161F or Pathology 213 and permission of the instructor. A tutorial course covering any aspect(s) of pathology with emphasis on the study of mechanisms of disease processes. Two seminar and two laboratory hours a week, on request. Staff.

217 LABORATORY ANIMALS IN RESEARCH (3). Prerequisite, permission of the instructor. Topics covered include the humane and legal responsibilities of researchers, selected animal models of human disease, impact on environment and disease research, and principles of animal surgery. Fall. Bellinger.

223 SPECIAL METHODS IN PATHOLOGY (2-5). Prerequisite, permission of the instructor. Conducted on a tutorial basis, with the aim of providing experience with specialized techniques including histotechnology, electron microscopy, fluorescent and phase microscopy, chromatography, electrophoresis, and microautoradiography. Two conferences, optional six laboratory hours a week. Spring. Staff.

225 CANCER PATHOLOGY (3). Permission of the course director required. This course examines pathobiological features of cancer. An interdisciplinary approach draws 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. Fall. Kaufmann.

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. Fall. (1999 and alternate years.) Coleman.

301 SEMINAR IN PATHOLOGY (2). This course consists of seminars designed to acquaint the student with recent literature in pathology, particularly as it relates to research activities carried out within the department. Hours to be arranged. May be repeated. Staff.

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. Staff.

393 MASTER'S THESIS (0-6). Fall, spring, and summer. May be repeated. (Total maximum of six credits.) Staff.

394 DOCTORAL DISSERTATION (0-9). May be repeated. Fall, spring, and summer. Staff.

400 GENERAL REGISTRATION (0).

Courses for Graduates

213 GRADUATE PATHOLOGY: MECHANISMS OF DISEASE (3-5). Prerequisite, permission of the director of Graduate Studies. Response to cell injury and pathogenesis of disease with emphasis on mechanisms of basic processes in pathology at the molecular, cellular, and organismal levels. Three lecture and two and one-half laboratory (optional for nonmajors) hours a week. Spring. Edgell.

DEPARTMENT OF PHARMACOLOGY

RUDOLPH L. JULIANO, Chair

Professors

George R. Breese (15) Drugs and Neural Plasticity; Molecular Neurobiology
Fulton T. Crews (88) Neurotransmitter and Hormone Signal Transduction
Channing Der (74) Ras Protein Superfamily, Signal Transduction and Oncogenesis
Kenneth H. Dudley (28) Drug Biotransformation, Pentrugellar Hypersensitivity
Linda Dykstra (55) Opioid Analgesics; Drugs of Abuse
H. Shelton Earp (63) Growth Regulation, Growth Factor and Protein Kinases
John T. Gatzy (6) Epithelial Barriers, Cell Pharmacology and Toxicology
Barry Goe (29) Virus and Cancer Chemotherapy
T. Kendall Harden (37) Receptor Biochemistry; Regulation of Second Messenger Signaling
Rudolph L. Juliano (62) Membrane Biochemistry of Cell Interactions, Drug Delivery Systems
J. Stephen Kiter (34) Molecular and Cellular Biology of Post-Translational Processing
Ryszard Kole (57) RNA Splicing, RNA-Protein Interactions, Antisense Oligonucleotides
Richard B. Mailman (32) Molecular and Biochemical Neuropharmacology and Molecular Drug Design
Kenny D. McCarthy (42) Role of Glia in Brain Function, Pharmacology of Specific Cell Classes
Beverly S. Mitchell (73) Molecular Mechanisms of Nucleoside Activation; Cancer Pharmacology
Robert A. Mueller (32) Neuronal Stimulation and Oncogene Expression
David A. Onjies (30) Endocrine Pharmacology, Clinical Endocrinology
Gene A. Scarborough (36) Molecular Basis of Plasma Membrane Structure and Function
Dhiren Thakker (97) Drug Delivery and Metabolism
Ronald G. Thurman (38) Alcoholic Liver Injury, Liver Transplantation
Gilbert White (78) Structure/Function Relations of Platelet Membrane Glycoproteins Ib and IIa; Intracellular Messengers in Platelet Activation

**Associate Professors**
Curtis Harper (22) Acute Lung Injury
William Maixner (64) Pain Research and Autonomic Nervous System Research
Leslie Morrow (105) Molecular Neuropharmacology of GABA Receptor and Alcohol
Robert A. Nicholas (68) Structure/Function of Cell Surface Receptors, Antibiotic Resistance
Barry S. Pallotta (58) Kinetic Behavior of Single Ion Channels
Leslie V. Parise (70) Adhesion Receptors and Transmembrane Signaling
Robert L. Rosenberg (69) Regulation of Ion Channels
Richard Samulski (77) Development of Efficient Viral Vectors for Gene Delivery into Eukaryotic Genes

**Assistant Professors**
Adrienne D. Cox (90) Ras Family Oncogenes, Lipid Modification and Protein Function
Lee M. Graves (89) Growth Factor-Mediated Signal Transduction
Lian Li (99) Molecular Neurobiology of Synaptogenesis and Neurotransmitter Release
John Sondek (100) X-ray Crystallography and Transmembrane Signaling

**Research Associate Professors**
Philip L. Carl (59) DNA Replication and Repair, Cancer and Viral Chemotherapy
Gayle E. Lester (60) Biochemical Characterization of Musculoskeletal Connective Tissues
Qi-Yi Liu (103) Structure and Function of Ion Channels and Transport Proteins

**Research Assistant Professors**
Daniel Altschuler (91) Regulation of Rap 1 Activation
Jose Boyer (79) Regulation of Signal Transmission Mechanisms
Lih-Shen Chin (104) Molecular Mechanisms and Gene Therapy of Neurological Disorders
Geoffrey Clark (102) Mechanism of Ras Oncogene Mediated Transformation, Breast Cancer
Ullhas Naik (92) Platelet Physiology: Protein Phosphorylation and Cell Adhesion Receptors
U. S. Rao (93) Biochemistry of MDR and Cystic Fibrosis

Jose Spychala (81) Regulation of Adenosine, Nucleotide and Nucleoside Analogues, Metabolism
Ian P. Whitehead (101) Dbl Family Oncogenes, Small G Proteins and Signal Transduction

**Adjunct Professors**
Colin Chignell (94) Photochemical and Photobiological Reactions of Drugs and Environmental Chemicals
Emmanuel J. Diliberto Jr. (61) Neuropharmacology
Raymond J. Dingerode (40) Neuropharmacology
Gerriade B. Elion, Emeritus
George H. Hitcheings, Emeritus
Clifford L. Mitchell (46) Behavioral Toxicology
James W. Putney (84) Second Messenger Signaling

**Adjunct Associate Professors**
Kenneth S. Korach (85) Biochemistry and Biology of Steroid Hormone Receptors
Lawrence Lazarus (98) Opioid Peptides and Opioid Receptors
Thomas Spector (51) Enzymology

**Adjunct Assistant Professor**
Eric Lai (71) Structure/Organization of Extrachromosomal Elements in Drug-Resistant Cells

**Professors Emeriti**
Hugh J. Burford
Fred Wilson Ellis
Philip F. Hirsch
Tom S. Maya
Paul L. Munson
William Henry Pearlman
Doris T. Poole
Roy V. Talmage
Svein U. Tovende

The Department of Pharmacology offers a program of study which 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; 6) drug metabolism and distribution; and 7) 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 in the Faculty Laboratory and Office Building where it occupies approximately 26,000 square feet exclusive of classrooms and animal facilities.

Assistantships and Other Student Aid

Financial assistance is provided to all students. The stipend is currently $15,700 per year. Health insurance coverage is provided to all students.

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

201 RECEPTORS AND SIGNAL TRANSDUCTION (3).
Prerequisite, biochemistry with some molecular biology or permission of the instructor. In-depth study of receptors (G protein-linked, ion channels, tyrosine kinase, adhesion), intracellular signaling (phosphorylation, cAMP, inositol lipids, Ras) and kinetics of drug-receptor interactions. Three lecture hours a week. Fall. Parisi.

202 PRINCIPLES OF PHARMACOLOGY AND TOXICOLOGY
(Toxicology 202) (5). 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. Pallotta.

204 CARDIOVASCULAR AND RENAL PHARMACOLOGY (2).
Prerequisites, Pharmacology 202 and permission of the instructor. Recent advances in the elucidation of the mechanisms by which cardiotonic, antidyssrhythmic, and diuretic agents alter cardiac and renal function. Two lecture hours a week. Spring. Gaty.

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. Juliano.

207 ADVANCED TOXICOLOGY (Toxicology 207) (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 a week. Fall. Toxicology: Swenberg.

209 BIOTRANSFORMATION OF XENOBIOTICS (Toxicology 209) (2).
Prerequisites, Biochemistry 100 or equivalent or permission of the instructor. Recent advances in the mechanisms by which drugs and other foreign chemicals are metabolized to active or inactive products. The importance of metabolic pathways to therapy/toxicity. Two lecture hours a week. Fall. Harper; associates.

211, 212 INTRODUCTION TO PHARMACOLOGICAL RESEARCH (4 each). 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. Gaty.

213 INTRODUCTION TO PHARMACOLOGICAL RESEARCH
(2). Prerequisites, Pharmacology 211 and 212. This is a continuation of Pharmacology 211 and 212. Six laboratory hours a week, first summer session. Gaty.

214 INTRODUCTION TO PHARMACOLOGICAL RESEARCH
(2). Prerequisites, Pharmacology 211, 212, and 213. This is a continuation of Pharmacology 211, 212, and 213. Six laboratory hours a week, second summer session. Gaty.

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 BIOLOGY OF CELL ADHESION RECEPTORS (2).
Seminar/discussion course on the cellular and molecular biology of integrins and other cell adhesion molecules. Spring. (Alternate years.) Juliano/Parisi.

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, Pallotta.

221E NEUROPHARMACOLOGY OF ALCOHOL AND SUBSTANCE ABUSE (3).
A lecture/discussion course on the biological bases of alcohol and substance abuse. Spring. (Alternate years.) Morrow.

221F GENE THERAPY: MEDICINE FOR THE 21ST CENTURY (2).
A seminar/discussion course on recent advances in targeted gene delivery and gene therapy. Spring. (Alternate years.) Samulski.

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.) Maizner, Dykstra, Hollins, Light.

221I STRUCTURE AND FUNCTION OF INTEGRAL MEMBRANE PROTEINS (2).
A seminar/discussion course on the biochemistry and molecular biology of membrane proteins. Fall. (Alternate years.) Nicholas, Scarborough.

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.

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. Staff.

310 RESEARCH IN NEUROBIOLOGY (Biochemistry 310) (Neurobiology 310) (Pathology 310) (Physiology 310) (Psychology 310) (Biological 310) (3-12). Prerequisite, permission of a staff member of the Neurobiology Program. Research in various aspects of neuroscience. 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 present and discuss the important current pharmacological literature. Two hours a week. Fall and spring. Nicholas, McCarthy.

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 and spring. 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. Staff.

394 DOCTORAL DISSERTATION (3 or more). Prerequisite, permission of the staff. Fall, spring, and summer. Staff.

400 GENERAL REGISTRATION (0).

SCHOOL OF PHARMACY

WILLIAM H. CAMPBELL, Dean

Professors
William H. Campbell (83) Pharmacoeconomics, Pharmacy and Health Care Policy, Pharmacy Manpower
George H. Cocolas (2) Stereochemistry of Drug-Receptor Interactions, CNS Cholinergic Mechanisms
Frederick M. Eckel (9) Exploration and Role Development of Pharmacist as Health Team Member
B. W. Hadjula (19) Analysis of Drugs and Their Metabolic Degradation Products
Iris H. Hall (15) Anticancer Drug Mechanisms
Abraham G. Harteema (42) Pharmacoeconomics, Pharmaceutical Outcomes Research, Health Services Research, Program Evaluation
Kuo-Hsiung Lee (13) Medicinal Chemistry of Bioactive Natural Products and Synthetic Analogs Including Antitumor, Anti-AIDS, Antimalarial, Antihypertonic, Anti-inflammatory, and Antiviral Agents; Antifungal Antibiotics, Insect Antifeedants; Anti-arthritis and Chinese Herbal Medicine
G. Joseph Norwood (73) Pharmaceutical Economics and Marketing, Prescription Insurance

John A. Pieper (93) Cardiovascular Pharmacokinetics and Pharmacodynamics
Dhirren R. Thakker (87) Mechanisms of Drug Transport, Pro-drug Strategies for Enhanced and Targeted Drug Delivery, Disposition of Macromolecules (e.g., Genes)

Associate Professors
Raymond O. Booth (72) Design and Pharmacological Evaluation of Agents That Affect Brain Carexholamine Neurotransmitter Systems, Neurotoxicology of Brain Neurotransmitter Systems
Stephen M. Caiola (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
Anthony J. Hickey (86) Pulmonary Drug Delivery, Aerosol Formulations
Khalid S. Ishaq (21) Design and Synthesis of Antiviral Agents
Timothy J. Ives (90) Ambulatory Care, Pharmacy Practice
Richard J. Kowalsky (26) Radiopharmaceuticals
Celeste M. Lindley (38) Immunomodulation and Its Role in Cancer Therapy, Adjunctive Therapy in Cancer Patients
J. Herbert Patterson (47) Pharmacokinetic Evaluation of Cardiovascular Drugs
A. Wayne Pitzman (30) Hypertension, Clinical Pharmacokinetics, Cardiology and Drug Administration
Gary M. Pollack (53) Pharmacokinetics and Pharmacodynamics of CNS Active Agents, Pharmacokinetic Model Development, Toxicokinetics
Charles C. Pulliam (71) Geriatrics, Epidemiology of Adverse Drug Reactions, Post-Marketing Surveillance
Ralph H. Raasch (32) Infectious Diseases, Parenteral Nutrition
William T. Sawyer (56) Coagulation, Pharmacochemistry of Anticoagulant Drugs
Robert P. Shrewsbury (39) Biopharmaceutics
Philip C. Smith (85) Pharmacokinetics, Drug Metabolism
Steven D. Wyrick (48) Design and Synthesis of Novel Antidopaminergic Antipsychotic Agents; Novel Sigma Receptor Ligands; Synthesis of High Specific Activity, Site-Specific, Radio-Labeled, and Mass-Labeled Compounds of Biological and Pharmacological Interests

Assistant Professors
Kenneth F. Bastow (84) Design and Testing of Substrate-Based Inhibitors, Biotechnological Approaches to Drug Design and Production
Robert E. Dupuis (98) Clinical Pharmacokinetics, Transplantation
Ann E. Eakin (88) Structure-Based Drug Design, Protein Structure/Function, Molecular Parasitology
Teresa L. Kauf (89) Health Economics, Pharmaco-Economics, Managed Care
Ed LeCluyse (95) Hepatic Drug Disposition and Regulation of Drug-Metabolizing Enzymes
Christy S. Scott (94) Pain Management in Infants, Antibiotics in Cystic Fibrosis
Ya-Chen Tina Shih (96) Pharmaco-Economics, Health Policy, Labor Economics
Betsy L. Sloath (91) Pharmaceutical Sociology, Drug Utilization Review, Patient Compliance
Scott R. Smith (101) Outcomes Research, Pharmacy Administration
Jefferson R. Sures (76) Lipid Chemistry, Complex Phospholipid Synthesis, Bioactive Ether Lipid Analogs
Alexander Trephsa (81) Molecular Modeling, Computer-Assisted Drug Design, Molecular Dynamics of Proteins, Protein Folding
Dennis M. Williams, Pharmacokinetics and Pharmacodynamics, Inhalation Therapy for Pulmonary Disease, Hypertension

Research Assistant Professors
Sydney P. Craig, Protein Structure/Function, Enzyme Structure-Based Drug Design
Susan Morris-Natashke, Synthesis and Structure-Activity Correlations of Phospholipids and Derivatives as Anti-HIV-1 Agents
Josef I. Vaiaman, Computer Simulation of Liquids and Biomolecular Systems, Biomolecular Informatics and Computer Networks

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. Kaluny, Organizational Behavior, Innovation Diffusion, Medical Care

Clinical Associate Professors
Deborah Montague, Cardiovascular Drug Therapy
J. Robert Powell, Clinical Pharmacokinetics and Drug Metabolism
William N. Zelman, Health Finance

Clinical Assistant Professors
Kimberly H. DeLoach, Educational Media and Instructional Design
Colleen Gesham, Drug Utilization Review
John M. Kessler, Pharmacoeconomics and Drug Information

Adjunct Professors
C. Edgar Cook, Steroid and Flavonoid Synthesis, Isolation and Structure of Naturally Occurring, Biologically Active Compounds, Drug Metabolism and Analysis
Michael Cory, Design, Synthesis, and Binding Studies of DNA Intercalating Agents, Quantitative Structure-Activity Relationships, Computer Applications to Drug Design
Andrew T. McPhail, X-ray Crystal Structure Analysis of Naturally Occurring Compounds and Their Analogs, Synthesis and Structural Studies of Boron-Containing Amino Acids and Peptide Analogs
Gerald Miwa, Drug Safety and Drug Metabolism
James Swarbrick, Physical Pharmacy and Biopharmaceutics
Richard Welch, Drug Metabolism

Adjunct Associate Professors
Kun Chae, Receptor Binding Involving Estrogen and Other Synthetic Estrogenic Compounds
James Crow, Pulmonary and Hematology Inflammation
William Gillespie, Theoretical and Computer Analysis of Pharmacokinetic Systems and Kinetics of Pharmacologic Response (Pharmacodynamics)
Allen A. Lai, Pharmacokinetics and Pharmacodynamics

Adjunct Assistant Professors
Kenneth R. Brouwer, Drug Metabolism; Pharmacokinetics
Robert A. Casper, Evaluation and Development of Polymeric Materials for Use in Controlled Drug Delivery and Novel Primary Drug Packaging
Lawrence L. Gan, Drug Metabolism and Pharmacokinetics
S. Frances Guelteiri, Infusion Therapy, Intravenous Admiixture Systems
Roxanne C. Jewell, Clinical Pharmacokinetics, Protein Binding
Keith A. Johnson, Research and Development in Chemical Engineering, Biloid and Interface Science, Aerosol Science, and Pharmaceutical Science
Frank Lee, Drug Metabolism and Pharmacokinetics/Pharmacodynamics

Stanley Levy, Cosmetic Science and Technology
Alan Parr, Pharmaceutics
Virginia D. Schmitt, Clinical Pharmacokinetics, Pharmacodynamics
Michiel Van Oort, Inhalation Product Development

Professors Emeriti
Melvin A. Chambers
George P. Hager
Albert M. Mattocks
Claude Piantadosi
Jack K. Wier

The School of Pharmacy offers graduate courses leading to the degrees of Master of Science and Doctor of Philosophy. Graduate degrees in four separate divisions are described below. The School of Pharmacy is located in a major health science complex together with the Schools of Dentistry, Medicine, Nursing, and Public Health.

Instruction emphasizes research and is given by means of lectures, recitations, and seminars combined with appropriate work in the laboratories. Because of the excellent rapport that exists between schools, departments, institutes, and centers and the graduate programs in the School of Pharmacy, the graduate student has the opportunity for interdisciplinary cooperative research. The graduate degree programs also benefit from the relations of the faculty with the Research Triangle Institute, Glaxo Wellcome Inc., Oak Ridge Associated Universities, Duke University, and Bowman Gray School of Medicine.

The pharmacy profession, the pharmaceutical industry, government agencies, and academic institutions provide many and varied opportunities for men and women in the pharmaceutical sciences as offered at The University of North Carolina at Chapel Hill.

The School of Pharmacy occupies Beard Hall, with laboratory facilities that are well adapted to graduate instruction. The Health Sciences Library has an outstanding collection of books and journals and offers many library support services. Appropriate use is also made of the library and laboratory facilities offered by the Departments of Biochemistry, Biology, Chemistry, Pharmacology, Physiology, and the School of Public Health.

Medicinal Chemistry and Natural Products

The field of Medicinal Chemistry is interdisciplinary. It applies and extends the basic concepts of chemistry, biochemistry, and pharmacology to the investigation of biomedical problems. Areas of study can include structure-activity relationships, drug receptor interactions, and synthetic design using computer-assisted molecular mechanics, ab initio, and semi-empirical calculations with state-of-the-art graphics support. Also included are biochemical mechanisms of drug action and drug toxicity, problems of isolation of chemicals from natural sources and elucidation of their chemical structure, synthesis, and the development of analytical methods that apply to all of the above areas of research.

Research involving synthetic and natural products has special
implications for neurochemistry, enzymology, drug mechanisms, lipid chemistry, radioactive labeling, cancer chemotherapy, drugs for treatment of AIDS, and biochemical mechanisms. The M.S. and Ph.D. are offered.

**Pharmaceutics**

Pharmaceutics is an interdisciplinary field that focuses on optimizing drug therapy. The pharmaceutical sciences encompass the design and production of dosage forms (pharmaceutical chemistry and technology), in vivo performance of drug delivery systems (biopharmaceutics), and evaluation of the biologic effects associated with drug therapy (pharmacokinetics and pharmacodynamics). While it draws upon traditional pharmaceutical chemistry, Pharmaceutics at The University of North Carolina at Chapel Hill has a decidedly biologic focus, with a primary emphasis on interactions between drugs or dosage forms and biologic systems.

All graduate students (seeking the M.S. or Ph.D. degree) in the Division of Pharmaceutics are required to take a common core of course work designed to provide breadth and flexibility in this rapidly changing field. Building upon this core experience, students then specialize in one of three areas of concentration within the division: pharmacokinetics/pharmacodynamics, targeted drug delivery, or physical pharmaceutical chemistry. Many research projects involve more than one of these areas of concentration, resulting in an overall approach that is multidisciplinary. Exposure to a broad range of issues in the pharmaceutical sciences is maintained throughout the program of study with a regular seminar series.

Current research projects in the Division of Pharmaceutics are directed towards assessing drug transport across biologic membranes, pulmonary delivery of therapeutic agents, targeted intracellular drug delivery, and the factors affecting drug absorption, distribution, metabolism, and excretion, particularly as such processes affect the activity of conventional drugs and therapeutic macromolecules. A variety of model systems are used by graduate students in the division, including in vitro (chemical or subcellular preparations), cell structures (e.g., intestinal or hepatic cells from animal or human sources), isolated organs, in vivo animal, and clinical. In addition, extensive collaborative research is ongoing with investigators in the School of Medicine and a variety of institutions in the Research Triangle Park (Glaxo Wellcome, the U.S. Environmental Protection Agency, and the National Institute of Environmental Health Sciences, among others).

**Pharmaceutical Policy and Evaluative Sciences**

The field of Pharmaceutical Policy and Evaluative Sciences focuses on socioeconomic studies related to the development, introduction, distribution, use, and outcomes of pharmaceutical agents in society. The M.S. degree program provides a background in health and pharmaceutical policy, pharmaceutical marketing, technology assessment, epidemiology, economic evaluation, and research fundamentals. The program of study culminates in a thesis examining in more detail some facet of these pharmaceutical areas of inquiry. A degree in pharmacy is not required for admission into the program.

The Ph.D. program in Pharmaceutical Policy and Evaluative Sciences is offered in collaboration with two departments in the School of Public Health. Students interested primarily in economic and policy areas pursue the Ph.D. in Health Policy and Administration. Students interested primarily in outcomes research and pharmacoepidemiology pursue the Ph.D. in Epidemiology. U.S. News and World Report ranks the programs among the top three programs in the nation. To be eligible for admission to the doctoral program, applicants must hold a master's degree in Pharmacy Administration, Health Administration, Epidemiology, or the equivalent. The emphasis for Pharmaceutical Policy and Evaluative Sciences students is on the development of a theoretical and methodological perspective of pharmaceutical policy and economics and outcomes research within the context of the overall health care system. Upon completion of course requirements, the student develops a doctoral dissertation with advisement from faculty in the Division of Pharmaceutical Policy and Evaluative Sciences and the Department of Health Policy and Administration or the Department of Epidemiology.

**Pharmacy Practice**

The School of Pharmacy offers a graduate program in Pharmacy Practice, with several different tracks. Candidates for the Pharmacy Practice management track must have an undergraduate degree in Pharmacy. Program options include concurrent completion of an ASHP accredited residency at the University of North Carolina Hospitals, the training facilities of The University of North Carolina at Chapel Hill. The program leads to the Master of Science degree in Pharmacy with specialization in hospital pharmacy and a Certificate of Residency. During the summer, the student works full-time in residency activities. Students are provided with the opportunity to specialize in various areas of pharmacy practice during the second year of the program. The program begins on July 1. The student should become licensed to practice in the State of North Carolina by the second year in the program.

A wide variety of courses are available at the School of Pharmacy, the School of Public Health, and other University schools and departments from which to develop a student's program. The rotation of students among practice sites as part of the residency provides opportunities for gaining a knowledge base in such nonhospital settings as community health centers, health education centers, and mental health centers, as well as pharmaceutical industry or organizational pharmacy, thus providing valuable experience in new areas of pharmacy practice.

The division also offers a Clinical Drug Development track. Candidates for this program are not required to have a degree in pharmacy. Fellowships in drug development/clinical research are available. Some of these programs are joint offerings with pharmaceutical companies in the Research Triangle Park. In lieu of the residency requirement, the graduate student must complete a thesis.
Requirements for Admission

Admission to candidacy for the graduate program in the School of Pharmacy presupposes the completion of 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 Graduate School. Applications for admission must be supported by scores on the Graduate Record Examination Aptitude Test.

Inquiries and requests for application forms from predoctoral candidates should be directed to: Chair, Committee on Graduate Studies, School of Pharmacy, CB# 7360, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7360.

Graduate Assistantships and Fellowships in the School of Pharmacy

Graduate teaching assistantships in the School of Pharmacy provide a stipend averaging $13,500 for twelve months' service. The time required for teaching is twelve to fifteen hours per week.

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 dean of the School of Pharmacy.

MEDICINAL CHEMISTRY

Courses for Graduates and Advanced Undergraduates

121 CHEMISTRY OF NATURAL PRODUCTS (3). Prerequisites, Chemistry 166 or equivalent, permission of the instructor. An introduction to the isolation, structure determination, biosynthesis, and synthesis of important natural products; emphasis on aspects relating to medicinal chemistry. Three hours a week. Spring or fall. Lee and staff.

141, 142 INTRODUCTION TO RESEARCH IN MEDICINAL CHEMISTRY (1-3). Prerequisites, Chemistry 61, 62, permission of the professor. One conference and three or more laboratory hours a week. Fall and spring. Staff.

151 BIOMEDICINAL CHEMISTRY (3). Prerequisites, Medicinal Chemistry 68, 69, or permission of the instructor. Principles of genetic regulation and disease which alter drug handling by the body. The effects of drugs on the regulatory mechanisms of cell metabolism, immunode-fense, reproduction, and disease states. Three lecture hours a week. Fall or spring. Hall.

153 BASIC CONCEPTS OF CANCER AND ITS THERAPY (3). Prerequisites, Medicinal Chemistry 66 or Biochemistry 100, Pharmacology 55, 56, 216, Pharmacy Practice 76, 77, Physiology 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.

168 MEDICINAL CHEMISTRY (2). Prerequisites, Chemistry 61, 62, 66, Biochemistry 130 or equivalent, Physiology 140, Pharmacology 201. Two lecture hours a week. Fall. Staff.

169 MEDICINAL CHEMISTRY (2). Prerequisites, Chemistry 62, Physiology 140, or equivalent. Two lecture hours a week. Spring. Wyrick, Booth.

Courses for Graduates

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, 242 SPECIAL PRODUCTS IN MEDICINAL CHEMISTRY (1 or more). Prerequisites, Chemistry 61, 62, permission of the professors. One conference and three or more laboratory hours a week. Fall and spring. Staff.

243 SELECTED TOPICS IN SYNTHETIC ORGANIC MEDICINAL CHEMISTRY (2). Prerequisite, Chemistry 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, Chemistry 166 and 168. Discussions of important recent developments in the medicinal chemistry of bioactive natural products. Spring. (Alternate years.) Lee and staff.

275 MOLECULAR MODELING (3). Prerequisites, Math 31-32, Chemistry 181, permission of the instructor. Introduction to Computer-Assisted Molecular Design (CAMD) techniques and theory, with an emphasis on the practical use of molecular and quantum mechanics programs (MM2, MNDO, GAUSSIAN). Three lecture and three to four laboratory hours a week. Fall. Troshka.

276 MACROMOLECULAR MODELING (3). Prerequisite, Chemistry 130 or equivalent. Introduction to Computer-Assisted Molecular Design technique of macromolecules. Spring. Troshka.

361, 362 SEMINAR (1 each). Fall and spring. Hall.

391, 392 RESEARCH IN MEDICINAL CHEMISTRY (1-5). One conference and nine laboratory hours a week per course. Fall or spring. Staff.

393 MASTER'S THESIS (3). Fall and spring. Staff.

394 DOCTORAL DISSERTATION (3-5). Fall and spring. Staff.

400 GENERAL REGISTRATION (0).

PHARMACEUTICS

Courses for Graduates and Advanced Undergraduates

106 RADIOPHARMACEUTICALS (3). Prerequisite, Pharmacy 53, permission of the instructor. Principles and techniques of radioisotopes, the dispensing and control of radiopharmaceuticals. Three lectures a week. Spring. Kowalsky.

154 INTERMEDIATE PHARMACOKINETICS (2). Prerequisites, Pharmacy 72 or equivalent, permission of the instructor. Entry-level graduate course designed to acquaint students with pharmacokinetic theory, mathematical model development, and data analysis techniques. Two lecture hours a week. Fall. (Alternate years.) Brouwer, Pollock.

162 BASIC PHARMACEUTICS III (2). Prerequisites, Pharmacy 51, 62, or equivalent, permission of the instructor. Entry-level graduate course designed to acquaint students with basic physicochemical principles involved in the delivery of a drug molecule to an active site. Two lecture hours a week. Fall. (Alternate years.) Hadziia, Hickey.

163 ADVANCES IN DRUG DELIVERY (2). Prerequisites, Biochemistry 100 or equivalent, permission of the instructor. Discussion of the cellular uptake and transport mechanisms followed by survey of the conceptual basis and technical design of contemporary drug carrier systems. Two lecture hours a week. Fall. (Alternate years.) Cho.
171, 172. INTRODUCTION TO RESEARCH IN PHARMACEUTICS (1-3). Prerequisite, permission of the instructor. Students participate in special research projects designed to introduce them to research opportunities in pharmacetics. Three to nine lab hours a week. Fall, spring, and summer. Staff.

191. PHARMACEUTICAL ANALYSIS (1). Permission of the instructor. A course designed to introduce the student to the principles of quantitative pharmaceutical analysis. One lecture hour a week. Fall. (Alternate years.) Smith.

**Courses for Graduates**

251. TRENDS IN DRUG DELIVERY RESEARCH (3). Prerequisites, Pharmacy 165, permission of the instructor. Principles underlying delivery of therapeutic agents to particular target sites with concentration on cellular transport processes. Three lecture hours a week. Fall. (Alternate years.) Cho.

253. SPECIAL TOPICS IN ADVANCED PHARMACEUTICS (0-4). Prerequisite, permission of the instructor. A lecture and/or laboratory course designed to present new concepts and innovations in the area of pharmacetics (0-2 lecture hours and 0-6 lab hours a week). Fall, spring. Staff.

254. SPECIAL TOPICS IN ADVANCED PHARMACEUTICS (0-4). Prerequisite, permission of the instructor. A lecture and/or laboratory course designed to present new concepts and innovations in the area of pharmacetics (0-2 lecture hours and 0-6 lab hours a week). Spring. Staff.

256. ADVANCED PHARMACOKINETICS (4). Prerequisites, Pharmacy 154, permission of the instructor. Application of classical pharmacokinetic theory to mathematical model development, pharmacokinetic and pharmacodynamic data analysis, and experimental design. Four lecture hours a week. Spring. (Alternate years.) Pollock, Brouwer.

291. ADVANCED PHYSICAL PHARMACY I (3). Prerequisites, Pharmacy 162, permission of the instructor. Application of physicochemical principles to pharmaceutical systems with emphasis on solutions. Topics include kinetics, stability, dissolution, diffusion, colligative properties, surface chemistry, and ionic equilibria. Three lecture hours a week. Spring. (Alternate years.) Hickey, Hadziija.

361, 362. SEMINAR (1 each). Fall and spring. Staff.

391, 392. RESEARCH IN PHARMACY (1-5). Graduate course consisting of laboratory work, conferences with the major professor, and library investigations relating to research. One conference and nine laboratory hours per week. Fall and spring. Staff.

393. MASTER'S THESIS (3 or more). Fall and spring. Staff.

394. DOCTORAL DISSERTATION (3-5). Fall and spring. Staff.

400. GENERAL REGISTRATION (0).

**PHARMACEUTICAL POLICY AND EVALUATIVE SCIENCES**

**Courses for Graduates**

180. PHARMACEUTICAL RESEARCH, DEVELOPMENT, AND MARKETING (3). This course is to acquaint 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. Three lecture hours a week. Fall. Norwood, Sleath.

181. ETHICS AND THE PRACTICE OF PHARMACY (3). Prerequisites, Pharmacy Administration 89 and Pharmacy Practice 21, or equivalent, permission of the instructor. A discussion of ethical theories and themes that influence modern society and application of normative ethics to medicine, health care, and the profession of pharmacy. Three lecture hours a week. Fall. Staff.

190. SELECTED TOPICS IN PHARMACEUTICAL POLICY AND EVALUATIVE SCIENCES (1-3). A reading and/or special projects course for both undergraduate and graduate students interested in pursuing additional work in the administrative and social sciences as they pertain to pharmacy practice. One to three hours a week. Spring, fall, summer. Staff.

201. POLICY AND ECONOMICS OF PHARMACEUTICAL DISTRIBUTION (3). Prerequisite, Health Policy and Administration 220 or equivalent. Regulatory policy and the United States drug distribution system including prescribers, payers, and the retail pharmacy industry are examined with regard to structure and performance of the distribution system. Three lecture hours a week. Spring. Staff.

203. METHODS IN PHARMACY SERVICES RESEARCH (3). Guides the student through research proposal development from identification of the research questions, research design, and selection of analytical techniques. Provides a foundation for conducting or interpreting pharmaceutical/services research. Three lecture hours a week. Spring. Hartzena.

251. ECONOMICS AND BEHAVIOR OF THE INTERNATIONAL PHARMACEUTICAL INDUSTRY (3). Provides an economic perspective on such issues as industry structure, regulation, pricing, research and development, product innovation, patent policies, and profitability. Three lecture hours a week. Spring. Kauf, Shih.

252. ECONOMIC EVALUATION OF HEALTH CARE TECHNOLOGY (3). Focus is on determination of costs and benefits associated with alternative resource allocation schemes. Cruxial economic concepts (e.g., utility valuation of health states and marginal analysis) are presented. Three lecture hours a week. Fall. Kauf, Shih.

362. SEMINAR (1). Spring. Staff.

391, 392. 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.

**PHARMACY PRACTICE**

**Courses for Graduates and Advanced Undergraduates**

108. CLINICAL PHARMACY CLERKSHIP (3-6). Prerequisite, permission of the instructor. Through assigned responsibility in Clinical Pharmacy Services students are exposed to and learn how to solve drug therapy problems. Fall and spring. Eckel, staff.

109. TOPICS IN ACUTE CARE PHARMACY PRACTICE (3). Prerequisites, Pharmacy Practice 76, 77, permission of the instructor. Focus is made upon choice and rationale for drug therapy, dosing guidelines, and monitoring parameters for assessment of drug efficacy and toxicity. Lectures and seminars concentrate on pathophysiology and drug management of problems commonly seen in acute care settings. One lecture and two lab hours a week. Fall. Staff.

110. AMBULATORY CARE PHARMACY PRACTICE (3). Prerequisites, Pharmacy Practice 76, 77, permission of the instructor. Didactic instruction is provided on selected subjects in therapeutics relevant in ambulatory patient care. Proficiency in ambulatory clinical pharmacy practice is gained through discussion sessions and laboratory experiences in specific ambulatory patient care environments. Three lectures a week. Fall and spring. Williams.

132, 133. TOPICS IN HOSPITAL PHARMACY (1-3). Prerequisites, Pharm.D., graduate standing, permission of the instructor. Various topics of interest to the students and faculty are presented in seminar format. Topics presented are related to pharmacy management and/or clinical practice. Fall and spring. Sawyer, staff.
134 CLINICAL THERAPEUTICS CONFERENCE (3). Prerequisites, Physiology 93, Pharmacy Practice 76, 77, permission of the instructor. Utilizes lectures, seminars, and case presentations to introduce the student to the knowledge system of clinical pharmacy. Students learn didactic skills in laboratory methods, physical assessment, medical terminology, and utilization of the medical record. Individual case presentations are utilized to emphasize oral and written communication skills. Spring. Staff.

135, 136 INTRODUCTION TO RESEARCH IN PHARMACY PRACTICE (1-3). Prerequisite, permission of the instructor. Students participate in ongoing faculty projects. Involvement varies from laboratory work to literature searches, to patient studies. Fall and spring. Eckel, staff.

139 COMPUTER APPLICATIONS IN CLINICAL PHARMACOKINETICS (3). Prerequisites, Pharm.D., graduate standing, permission of the instructor. Principles of linear, nonlinear, and bayesian analysis, and computerized analysis of clinical scenarios of specific therapeutic agents via multiple programs form the core of this course which is taught in the computer laboratory. Two lecture hours and two lab hours a week. Spring. Carson, staff.

176, 177 ADVANCED CLINICAL PHARMACY (3). Prerequisite, graduate standing. Discussions, workshops, and lectures to develop the student’s skills and abilities to make therapeutic recommendations, utilize the drug literature, educate patients and health professionals, and record observations, plans, and actions in a problem-oriented record. Three lecture weeks a week. Fall and spring. Staff.

178 DRUG INFORMATION RETRIEVAL AND ANALYSIS (2). Prerequisites, Pharm.D., graduate standing. Concepts of drug information practice are presented including types of drug information requests, drug information sources, and drug literature evaluation. Drug utilization review, adverse drug reaction surveillance, and the impact of the medical literature on rational therapeutics and prescribing are also examined. One lecture hour and three lab hours a week. Fall. Staff.

179 MONITORING DRUG THERAPY (3). Prerequisites, Pharm.D. or graduate standing, permission of the instructor. Skills in the assessment of a patient’s physical findings assist the pharmacist in drug therapy evaluation and monitoring. The student learns how to interview a patient to gain an accurate medication history, record findings in a medical record, and determine improvement or ill effect in a patient due to drug therapy. The role of the pharmacist in a triage role can be greatly enhanced by skill in physical assessment. Such skills can augment the ability to judge success and failure to drug therapy and provide the ability to evaluate complications of drug therapy. Moreover, it facilitates pharmacist interaction with physicians on the health care team, provides essential research skills, and improves his or her ability to act as a paramedical health provider. Two lecture hours and two lab hours a week. Summer. Staff.

193 RESEARCH METHODS IN PHARMACY PRACTICE (3). Prerequisite, permission of the instructor. An introductory course on research methods focusing on biostatistics in research in health service, epidemiologic, and clinical aspects of pharmacy practice. Fall. Sawyer.

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. Two lecture hours a week. Fall. Caio.

211 DESIGN AND ANALYSIS OF CLINICAL DRUG TRIALS (2). Prerequisites or corequisites, Biostatistics 113 and 145 or equivalent courses, permission of the instructor. Discussion of approaches to data analysis of clinical drug studies. Common study designs and their implementation are reviewed. Two lecture hours a week. Spring. Hull.

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 delivery of health care and review ways in which the pharmacist might contribute to the hospital’s role. Three lectures a week. Fall. Eckel.

250 PRINCIPLES OF PHARMACY PRACTICE (3). Prerequisite, Pharmacy Practice 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. Eckel, Sawyer.

251 CASE STUDIES IN INSTITUTIONAL PHARMACY PRACTICE I: PERSONAL DEVELOPMENT AND HUMAN RESOURCE MANAGEMENT (2). Prerequisites or corequisites, Pharmacy Practice 249 and 250, permission of the instructor. Lecture, background readings, analyses 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, Pharmacy Practice 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 change is responsible for the assignments and approval of the subject and character of the degree paper. Staff.

393 MASTER’S THESIS (3 or more). Fall and spring. Staff.

400 GENERAL REGISTRATION (0).

DEPARTMENT OF PHILOSOPHY

DOUGLAS C. LONG, Chair

Professors
Louise M. Antony (32) Philosophy of Language, Philosophy of Mind, Feminism
Simon W. Blackburn (30) Metaphysics, Epistemology, Philosophy of Language, Moral Theory
Barnard Bocchi (26) Social and Political Philosophy
Thomas E. Hill Jr. (24) Ethics, Political Philosophy
Michael K. Hooker (35) History of Modern Philosophy
Douglas C. Long (8) Philosophy of Mind, Ethics, Epistemology
William G. Lycan (22) Philosophy of Mind, Philosophy of Language, Epistemology
Stanley Munsch (9) Philosophy of Mind, Epistemology, Cognitive Science
Gerald J. Postema (20) Legal Philosophy, Political Philosophy, Ethics
Michael D. Resnik (11) Logic, Philosophy of Mathematics, Decision Theory
Jay F. Rosenberg (12) Epistemology, Metaphysics, Recent Analytic Philosophy
Geoffrey Sayre McCord (25) Moral Theory, Epistemology
George Schlesinger (13) Philosophy and History of Science
Richard A. Smyth (14) History of Modern Philosophy, History of Logic of Science
Associate Professors
Donit Bar-On (29) Philosophy of Language, Philosophy of Mind, Ethics
Edward M. Galligan (5) Ancient, Medieval, Recent Analytic Philosophy
Keith Simmons (27) Logic, Philosophy of Language
Richard H. Zaffron (16) Philosophy of the Social Sciences

Assistant Professors
Roderick T. Long (31) Ancient, Medieval Philosophy, Political Philosophy
Robert D. Vance (15) Philosophy of Art, History of Modern Philosophy

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
Virgil C. Aldrich
Paul Ziff

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
(Prerequisite, one course below 100 or consent of the instructor.)

101 SYMBOLIC LOGIC (Linguistics 104) (3). Fall. Resnik, Simmons.
103 PHILOSOPHY OF ART (3). Spring. Vance.
105 POLITICAL PHILOSOPHY FROM HOBBES TO Rousseau (3). Fall. B. Boxill.
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. Schlesinger.
109 PHILOSOPHICAL PROBLEMS IN PSYCHOLOGY (3). Fall or spring. Zaffron.
110 PHILOSOPHY OF LANGUAGE (Linguistics 110) (3). Fall or spring. Antony, Munsat, Lycan, Bar-On.
111 ADVANCED SYMBOLIC LOGIC (3). Spring. Resnik, Simmons.
112 CONTEMPORARY MORAL PHILOSOPHY (3). Fall or spring. D. Long, Hill, Sayre McCord, Blackburn.
113 PHILOSOPHY OF LAW (3). Fall or spring. Postema.
114 THE BEGINNINGS OF ANALYTIC PHILOSOPHY (3). Fall or spring. Rosenberg, Lycan, Blackburn.
115 FOUNDATIONS OF MATHEMATICS (3). Fall or spring. Resnik.
117 PHILOSOPHY OF MIND (3). Fall or spring. Antony, Lycan, D. Long, Blackburn.
120 CONTEMPORARY MORAL AND SOCIAL PROBLEMS (3). Fall or spring. D. Long, Sayre McCord, B. Boxill.
121 SPACE AND TIME (Physics 113) (3). Spring. Schlesinger, Van Dam.
130 RECENT DEVELOPMENTS IN POLITICAL PHILOSOPHY (3). Spring. Postema, B. Boxill.
142 PHILOSOPHY IN LITERATURE (Comparative Literature 142) (3). Spring. Smyth.
150 PLATO (3). Fall. Galligan, R. Long.
152 TOPICS IN MEDIEVAL PHILOSOPHY (Religion 132) (3).
Spring. Galligan, R. Long.
153 CONTINENTAL RATIONALISM (3). Fall or spring. Smyth,
Munsat.
155 KANT (3). Fall. Rosenberg, Smyth, Vance, Hill.
156 HEGEL (3). Spring. Smyth, Postema.
158 EXISTENTIALISM AND PHENOMENOLOGY (3). Spring.
Smyth.
159 TOPICS IN AMERICAN PHILOSOPHY (3). Spring. Smyth.
178 HEALTH CARE, SCIENCE, AND PHILOSOPHY (Physical
Therapy 178) (3). Fall. Schlesinger, Mitchell.
190 SET THEORY AND LOGIC (3). 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. Spring. Resnik, Simmons.
203 METAPHYSICS (3). May be repeated for credit. Spring.
Rosenberg, Blackburn.
204 EPISTEMOLOGY (3). May be repeated for credit. Fall. D. Long,
Lycan, Blackburn.
205 VALUE THEORY (3). May be repeated for credit. Spring. Hill.
206 STUDIES IN CONTEMPORARY ANALYTIC PHILOSOPHY (3).
May be repeated for credit. Fall and spring. Rosenberg, Munsat,
Schlesinger, Lycan.
207 STUDIES IN THE PHILOSOPHY OF SCIENCE (3). May be
repeated for credit. Fall or spring. Schlesinger, Lycan, Rosenberg.
208 NORMATIVE ETHICAL THEORY (3). May be repeated for
credit. Fall or spring. Hill, Blackburn.
209 TOPICS IN FEMINIST THEORY (Women’s Studies 209) (3).
Spring. Antony.
212 ADVANCED PROBLEMS IN PHILOSOPHY OF LANGUAGE
(Linguistics 212) (3). Fall or spring. Antony, Munsat, Lycan,
Bar-On, Blackburn.
300 PROTO-SEMINAR IN PHILOSOPHY (3). For first-year
graduate students in the department. 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. Antony, Munsat, Lycan, Bar-On, Blackburn.
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.
400 GENERAL REGISTRATION (0).

DEPARTMENT OF PHYSICAL
EDUCATION, EXERCISE AND
SPORT SCIENCE

FREDERICK O. MUELLER, Chair

Professors
John E. Billing (14) Administration, Physiology of Exercise
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
Anthony C. Hackney (21) Exercise Physiology, Metabolism and
Endocrinology

Assistant Professors
Kevin L. Guskiewicz (24) Athletic Training, Anatomy
Bonita Marks (26) Exercise Physiology
Diane E. Stevens (27) Sport Psychology

Adjunct Professors
John Anderson, Nutrition in Exercise
David Sheps, Exercise Cardiology
Timothy Taft, Sports Medicine

Adjunct Assistant Professors
Michael T. Gross, Biomechanics
Daniel Hooker, Sports Medicine

Professors Emeriti
Carl S. Blyth
Patrick F. Earley
Boyd L. Newnan
William H. Peacock
Frank Pleasants Jr.

The Department of Physical Education, 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, sport psychology, and sport
administration.

Program Description (Areas of Emphasis)

Athletic Training

The athletic training specialization is a NATA-approved pro-
gram. 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 university-level athletic administration. The intensive two-year program combines formal course work, practicum experiences, and a full-time internship in an athletic department setting.

**Sport Psychology**

The sport psychology specialization offers advanced course work and practicum experiences designed around theoretical and research-based aspects of sport psychology. Students systematically examine psychological and social psychological variables that influence and regulate sport performance, and then apply this information under supervised conditions.

**Master of Arts**

Thirty hours of graduate work are required, including a minimum of eighteen hours in exercise and sport science. PHYE 220, 225, and 393 are required of all M.A. students. Additional courses may be required, depending upon the area the student wishes to emphasize. 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.

A limited number of applicants who have not majored in physical education may be accepted into the Master of Arts program. Applicants must complete fifteen credits of specified undergraduate prerequisite courses. Prior to enrolling in the graduate program, these individuals must have completed a minimum of nine semester hours (three courses) of specified undergraduate physical education major courses.

**Teaching Assistantships**

The Department of Physical Education, Exercise and Sport Science awards a number of graduate teaching assistantships annually. A teaching assistant’s primary duties involve instructing sport skill classes for nonmajors. Students wishing to apply for one of these assistantships should complete and return the appropriate application form. Contact the director of graduate admissions in the Department of Physical Education, Exercise and Sport Science.

**Courses for Graduates**

**PHYE 110 EXERCISE TESTING AND PRESCRIPTION IN A HEALTHY POPULATION (3).** Prerequisites, PHYE 76 and PHYE 89. Methods and protocols for screening, evaluating and prescribing exercise programs for healthy adults. Emphasis is on exercise testing procedures and interpretation of results to promote a healthy physically active lifestyle.

**PHYE 110L LABORATORY FOR EXERCISE TESTING (0).** Prerequisites, PHYE 76 and PHYE 89. PHYE 110L is a laboratory course that accompanies PHYE 110.

220 DATA ANALYSIS IN PHYSICAL EDUCATION, EXERCISE AND SPORT SCIENCE (3). Prerequisite, graduate standing in physical education or permission of the instructor. Instruction in computer-assisted statistical analysis of univariate and multivariate exercise and sport science research problems. Fall and spring. Shields.

225 RESEARCH TECHNIQUES IN PHYSICAL EDUCATION, EXERCISE AND SPORT SCIENCE (3). Prerequisite, graduate standing in physical education or permission of the instructor. Study of the various techniques and designs used in research. Practical experience in the identification and delimitation of problems for research and the preparation of a research prospectus. Fall and spring. 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. Prentice.

232 HUMAN ANATOMY FOR ATHLETIC TRAINERS (4). Prerequisite, graduate standing in physical education 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. Guzikiewicz.

235 SPORTS MEDICINE ANALYSIS: SPECIAL PROBLEMS RELATED TO SPORTS MEDICINE (3). Prerequisite, permission of the instructor for nonmajors. Problem and research oriented. Spring. Prentice.


239 PRACTICUM IN ATHLETIC TRAINING (3). Prerequisite, graduate standing in physical education 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 PHYSICAL EDUCATION AND SPORT (3). Prerequisite, instructor’s permission for nonmajors. Policies and problems of organization and administration of athletic programs in colleges. Fall. Mueller.

245 TRENDS IN TEACHING PHYSICAL EDUCATION (3). Prerequisite, graduate standing in physical education or permission of the instructor. An examination of how teaching styles and curricular offerings are being influenced by developments in the field of physical education. Spring. Graduate faculty.

246 ORGANIZATIONAL AND FINANCIAL MANAGEMENT OF SPORT (3). Prerequisite, graduate standing in physical education 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. Billing.

247 INTRAMURAL AND EXTRAMURAL ACTIVITIES FOR SCHOOLS AND COLLEGES (3). Designed for physical education majors and students from allied areas. Study of the history, philosophy, principles, status, and problems of intramural programs. Organizational and administrative patterns, program of activities, evaluation, and other administrative areas are also covered. Theoretical and practical experiences are provided. Spring. Hyatt, Shields.

249 PRACTICUM IN SPORT ADMINISTRATION (3). Prerequisite, PHYE 240. The implementation of theories and practices in a professional setting under the direction of a competent practitioner. Spring. Billing.

251 SPORT PSYCHOLOGY (3). Prerequisite, PHYE 81 or permission of the instructor. A study of the personality and psychological variables affecting an individual’s performance in sport and exercise. Fall. Silva.
252 APPLIED SPORT PSYCHOLOGY (3). Prerequisite, PHYE 251 or permission of the instructor. Instruction in the development of intervention and psychological skills designed to enhance physical performance and improve the social climate of sport groups. Spring. Silva.

254 GROUP DYNAMICS IN PHYSICAL EDUCATION, EXERCISE AND SPORT SCIENCE (3). Prerequisite, graduate standing in physical education 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 PHYSICAL EDUCATION AND SPORT (3). A comprehensive study of race and gender discrimination, adherence, value development, violence, and other socialization factors in youth, college and Olympic sport. Spring. Graduate faculty.

259 PRACTICUM IN SPORT PSYCHOLOGY (3). Prerequisites, PHYE 251, 252, and permission of the instructor. The implementation of counseling techniques in a setting sponsored by a certified sport psychologist consultant. Fall. Silva.

270 MOTOR LEARNING (3). Prerequisite, PHYE 80 or permission of the instructor. A study of the physical and psychological factors that influence skill acquisition and performance in sport and exercise involving applications to teaching and coaching. Fall. Graduate faculty.

275 INFORMATION PROCESSING AND MOTOR CONTROL (3). Prerequisite, PHYE 80 or permission of the instructor. A study of the underlying processes that contribute to human motor performance, including closed-loop and open-loop mechanisms of controlling and modifying movements. Spring. 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 and spring. Hackney, McMurray.

281 CLINICAL EXERCISE TESTING AND PRESCRIPTION (3). Prerequisite, PHYE 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.

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. Fall. McMurray.

283 ASSESSMENT OF PHYSIOLOGICAL FUNCTIONS IN EXERCISE (3). Prerequisite, PHYE 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 physical education or permission of the instructor. In-depth study of selected advanced topics in exercise physiology. Emphasis on metabolism, biochemical, and cardiorespiratory physiology with student presentations on selected topics. Spring. Hackney.

289 PRACTICUM IN EXERCISE PHYSIOLOGY (3). Prerequisites, PHYE 280 or PHYE 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.

300 SPECIAL TOPICS IN PHYSICAL EDUCATION, 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 PHYSICAL EDUCATION, EXERCISE AND SPORT SCIENCE (1-3). Prerequisite, graduate standing in physical education 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.

400 GENERAL REGISTRATION (0).

DIVISION OF PHYSICAL THERAPY

DARLENE K. SEKERAK, Director

Associate 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
Barry R. Howes (3) Organization and Administration, Therapeutic Agents
Philip L. Witt (22) Research Design, Orthopedics, Spinal Dysfunction

Assistant Professors

Cynthia L. Lewis (38) Exercise Physiology, Pediatric Orthopedics, Developmental Disabilities
Bing Yu (43) Biomechanics, Rehabilitation, Movement Analysis

Clinical Associate Professors

Dianne Lindsey (34) Consultant to State Department of Public Instruction, School and Community Programs, Pediatrics
Darlene K. Sekerak (25) Pediatrics, Health Policy, Research Utilization
Judy A. White (36) Musculoskeletal/Neuromuscular Rehabilitation, Clinical Practice/Administration

Clinical Assistant Professors

Jyotsna Gupta, Orthopedics
Jonathan D. Hacke (42) Electrotherapy, Sports Medicine, Spinal Orthopedics, Manual Techniques
Karen L. McCulloch (39) Clinical Education, Adult Neurologic Dysfunction, Neuromuscular Rehabilitation
Thelma J. Mielnic (44) Clinical Education, Orthopedics, Epidemiology
Marie A. Reilly (35) Early Human Behavior and Development, Behavioral Motor Control, Developmental Disabilities
Cherie Rosemond (41) Geriatrics, Exercise Physiology, Clinical Orthopedics

Instructor

Vicki S. Mercer (40) Motor Control, Motor Learning, Posture and Balance across the Lifespan

Professors Emeriti

Marjory Wilson Johnson
Ruth U. Mitchell
Margaret L. Moore
Charlene M. Nelson  
Mabel M. Parker  
Charles F. Schuch  
Joyce W. Sparling

The Division of Physical Therapy of the Department of Medical Allied Health Professions 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 graduate program in Human Movement Science (MS) is designed for physical therapists and graduates in related fields who desire advanced knowledge in the scientific study of human movement. The program provides training for research, knowledge applied to clinical practice, and preparation for continued graduate education. Its 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, infant, child, and family studies, motor control, and sports physical therapy.

The Master of Science program requires satisfactory completion of thirty-six credit hours. The minimum requirements include thirteen credit hours of core courses, nine credit hours in the major specialty area, nine credit hours in a supporting area, and nine credit hours in courses outside of the Division of Physical Therapy. A written comprehensive examination and an oral defense of the thesis are also required.

Core requirements include:

HMSC 200-Scientific Basis of Human Motion (4 credits);  
HMSC 393-Master's Thesis (6 credits); in addition to the statistics course required for admission (3 credits); either a research design course (3 credits) or a second-level statistics course.  
Students are also required to take nine credits in a specialty track and at least nine credits in a supporting area. 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 of the neuromuscular system. Students may choose to concentrate on the developmental aspects of normal and abnormal development, 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. Courses listed in HMSC are available to graduate students enrolled in other areas of the University.

Course Descriptions

HMSC 170 ELECTRONICS FOR MOVEMENT ANALYSIS RESEARCH (1). Prerequisite, permission of the instructor. Designed to provide students the basic concepts/experience with electronic laboratory equipment and basic skills for constructing simple circuits, using measurement instruments for kinematic, kinetic EMG analysis of human movement. Two laboratory hours a week. Fall. Staff.

HMSC 183 OVERVIEW OF CLINICAL EDUCATION (3). Prerequisite, permission of the instructor. An overview of clinical education with information collected through literature search and discussions with instructor and guests responsible for areas in clinical education. Three lecture hours a week, upon request. Fall. Staff.

HMSC 200 SCIENTIFIC BASIS OF HUMAN MOTION (4). Prerequisites, Basic Kinesiology or equivalent, and either Psychology or Sociology or the equivalent and permission of the instructor. Provides the student with knowledge of biomechanics, neuroscience, behavioral, and environmental influences necessary for understanding the basis of motor skill development and control. Four lecture hours a week. Fall. Giuliani, Gross.

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/lab hours a week. Fall. Staff.

HMSC 243 TOPICS IN MOTOR CONTROL AND MOTOR LEARNING: THERAPEUTIC IMPLICATORS (3). Prerequisite, 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 ANALYSIS OF CLINICAL TESTS AND MEASUREMENT (3). Prerequisite, permission of the instructor. Critical analysis of clinical assessment methods and standardized assessment tools, including clinical reporting; observational methods; client, patient and family interviews, surveys and questionnaires; screening tests; norm-referenced and criterion-referenced tests. Content areas and target populations of tools selected for analysis are related to students’ interests and needs (e.g., use with adults or children, tests of motor proficiency and control, daily living skills; development; and health and welfare). Three lecture/discussion hours per week. Spring. Staff.

HMSC 282 INFANT AND FAMILY ASSESSMENT (3). Prerequisite, 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. Lewis, 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. Lewis, 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. Giuliani.

HMSC 292 DEVELOPMENTAL BIOMECHANICS (3). Prerequisite, permission of the instructor. Application of basic principles of mechanics to normal and abnormal musculoskeletal development throughout the life span. Analysis of the interactive effect of musculoskeletal development and movement. Three lecture hours each week. Fall. Staff.

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 294 EXERCISE TESTING AND TRAINING IN SPECIAL POPULATIONS (3). Prerequisite, permission of the instructor. The course emphasizes the changes and adaptations in the cardiovascular and musculoskeletal systems across the life cycle and in special populations with respect to exercise. Three lecture hours a week. Spring. Lewis.

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 BASIC ASPECTS OF AGING (1). Prerequisite, permission of the instructor. Lecture series providing a comprehensive, multidisciplinary 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. 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 interests 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. Exploration of the framework necessary to do and understand research with emphasis on hypothesis testing, measurement, design, interpretation, and research application. Fall. Witt.

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 (6). Fall, spring, or summer. Staff.

HMSC 400 GENERAL REGISTRATION (0). Fall, spring, or summer. Staff.

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 and II with Lab;
  - General Psychology; Physiology; and Human Growth and Development.
- 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

CBIO 191 HUMAN ANATOMY (5). By dissection of the human cadaver, together with lectures and demonstrations, the structural and functional aspects of the regions of the body under study are emphasized. As material is presented, the clinical significance of anatomical structures is stressed. Fall first year. Staff.

CBIO 193 HUMAN NEUROANATOMY (3). This course consists of a study of the brain and spinal cord with consideration given to clinical significance of anatomical structure. Specimens of human brain and spinal cord provide laboratory material. Spring first year. Staff.

MAHP 119 ADMINISTRATION AND LEADERSHIP IN PRACTICE ENVIRONMENTS (3). Prerequisite, permission of the instructor. Interdisciplinary leadership, administration: environment, organizations, service delivery models, collaborative relationships, human resource management, financing, regulation, planning, quality/productivity management; discipline-specific application. Fall second year. Staff.

PHYT 201 MOTOR DEVELOPMENT AND MEASUREMENT OF HUMAN MOVEMENT (3). Introduction to theories of human movement, development over the life span, and analysis of measurement of movement behavior. Overview of analysis and interpretation of basic clinical assessments COMMONLY USED IN PHYSICAL THERAPY PRACTICE. Fall first year. Lewis.

PHYT 205 MANAGEMENT OF PRACTICE ENVIRONMENTS (3). Planning, organizing, and managing a physical therapy service in an institution or agency. Organizations, personnel supervision, facility planning, fiscal management, communications, and medical and legal aspects of service programs. Fall second year. Howes.

PHYT 210 CARDIOPULMONARY AND OTHER SYSTEMS: PHYSICAL THERAPY INTERVENTION (3). The 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 second 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 evaluation and management. Emphasis on the physical and physiological bases of basic techniques and safety. Fall first year. Folger.

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. Howes.

PHYT 224 FUNCTIONAL ASSESSMENT (1) The study of clinical and standardized tests to measure human movement and function. Spring first year. Sekerakis.


PHYT 232 MUSCULOSKELETAL I: PHYSICAL THERAPY INTERVENTION (3). Basic concepts of the embryology, arthrology, histology, and pathology of the musculoskeletal system; tissue response and healing in the presence of musculoskeletal injury and disease. Spring first year. White.

PHYT 234 MUSCULOSKELETAL II: PHYSICAL THERAPY INTERVENTION (4). Assessment and treatment techniques used in the clinical management of musculoskeletal disorders of all joint complexes. Fall second 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). Prerequisite, permission of the instructor. Multidisciplinary seminar for health professions students using case-based, interdisciplinary intervention. Spring second year. Staff.

PHYT 237 MATERNAL AND CHILD HEALTH PRACTICE (2). Prerequisite, permission of the instructor. The course focuses on domains of concern within family-centered, community-based, interdisciplinary intervention. Spring second year. Staff.

PHYT 238 FOOT ORTHOTIC INTERVENTION FOR LOWER QUARTER DYSFUNCTION (2). Prerequisite, permission of the instructor. The course is designed to provide advanced learning in the area of examination, evaluation, diagnosis, prognosis, orthotic intervention and outcomes of patients with lower quarter dysfunction. Spring second year. Gross.

PHYT 239 ISSUES IN HEALTH CARE DELIVERY (2). Overview of the current scope, methods, resources, activities, and trends in health maintenance and delivery are presented, including health care reform. Fall second year. Sekerakis.

PHYT 242 PATHOLOGY/PHARMACOLOGY FOR PHYSICAL THERAPY (1). Pathology and pharmacology information is important for the practicing physical therapist. Spring first year. Sekerakis.

PHYT 250 ECOLOGY OF HEALTH CARE (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 (2). Introduction to logic of inquiry, clinical management, scientific methods, objective and subjective documentation, and analysis of patient/client outcomes and appropriate clinical research methodologies. Summer first year. Witt.

PHYT 252 EVIDENCE-BASED PRACTICE II (1). Application of the principles of research design and statistics to the evaluation, synthesis, and application of existing research in practice and in the clinical decision-making process. Fall second year. Sekerakis.

PHYT 254 EVIDENCE-BASED PRACTICE III (3). This course is an extension of 252. Students conduct scholarly projects under the supervision of individual faculty members. Spring second year. Staff.

PHYT 260 CLINICAL EDUCATION I (2). Introduction to clinical decision making, effective clinical problem solving, negotiation skills, teaching and learning styles, communication skills, written documentation skills, and time management. Spring first year. McCulloch.

PHYT 261 CLINICAL PRACTICUM I (4). Students practice basic assessment, treatment, technical, and communicative skills under the supervision of clinical instructor(s). Summer first year. McCulloch.

PHYT 264 CLINICAL PRACTICUM II (2). Students practice appropriate intermediate assessment, treatment, technical, and communicative skills under the supervision of clinical instructor(s). Spring second year. McCulloch.

PHYT 268 CLINICAL INTERNSHIP (8). Students practice appropriate advanced assessment, treatment, technical, and communicative skills under the supervision of clinical instructor(s). Summer second year. McCulloch.
PHYT 284 NEUROMUSCULAR: PHYSICAL THERAPY INTERVENTION I (4). Basic principles of motor learning and motor control, the World Health Organization (WHO) health model, the neurological evaluation, and the specific treatment techniques of sensory input and proprioceptive neuromuscular facilitation are presented. Fall second year. White.

PHYT 285 NEUROMUSCULAR: PHYSICAL THERAPY INTERVENTION II (3). This course provides the student with the theoretical, physiological, pathological, and behavioral basis for understanding common neurologic dysfunctions observed in adult and pediatric physical therapy. Spring second year. McCulloch.

PHYT 299 SEMINAR IN DIFFERENTIAL PHYSICAL THERAPY DIAGNOSIS (2). This course uses learner and faculty case presentations and group discussions to emphasize appropriate screening of patients/clients for pathology and referral obligations for problems beyond the scope of physical therapy. Spring second year. Witt.

DEPARTMENT OF PHYSICS AND ASTRONOMY
THOMAS B. CLEGG, Chair

Professors
Bruce W. Carney (32) 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
Louise A. Delan (49) Theoretical Particle Physics, Quantum Gravity
Kian S. Dy (8) Condensed Matter Theory, Surface States
Paul H. Framppton (33) Theoretical Particle Physics Including Gravity
John P. Hernandez (10) Condensed Matter Theory, Electron States
Paul S. Hubbard (11) Molecular Physics, Spin Relaxation
Hugon J. Karowski (37) Experimental Nuclear Physics
Edward J. Ludwig (13) Experimental Nuclear Physics
Laurie E. McNeil (36) Solid State, Optical and Transport Properties of Disordered Solids
Y. Jack Ng (30) Theoretical Particle Physics, Gravitation
James A. Rosen (41) Galactic and Extragalactic Astronomy
Lawrence G. Rowan (18) Electron Paramagnetic Resonance, Physics of Music, Electronics
Dietrich Schroer (19) Mössbauer Spectroscopy of Lattice Defects, Science and Policy
William J. Thompson (25) Theoretical Nuclear Physics, Nuclear Reactions
Hendrik Van Dam (26) Theoretical Physics
Sean Washburn (30) Experimental Condensed Matter and Low Temperature Physics
James W. York Jr. (27) Gravitation, Relativity, Theoretical Physics

Associate Professors
Gerald N. Cecil (47) Optical Observational Astrophysics
Charles R. Evans (48) Gravitation, Relativity, Theoretical Astrophysics
Horst Keesemeier (12) Nuclear Magnetic Relaxation in Solids

Assistant Professors
Jonathan Engel (57) Theoretical Nuclear Physics
Christian G. Iliadis (61) Experimental Nuclear Astrophysics
Jianping Lu (56) Condensed Matter Theory
Richard Superfine (55) Experimental Studies of Interfaces
A. Christopher Thompson (60) High Energy Astrophysics
Frank Tsui (59) Experimental Condensed Matter and Materials Physics
Yue Wu (54) Nuclear Magnetic Resonance
Otto E. Zhou (62) Materials Science

Research Professor
William M. Hook (52) Experimental Plasma Physics

Research Associate Professors
Daxing Han
Nalin R. Parikh (58)

Adjunct Professor
John M. Bane Jr. (29) Physical Oceanography

Adjunct Associate Professor
Lee T. Shapiro (43) Planetariums, Science Education

Adjunct Assistant Professors
Jonathan M. Rutland, Nuclear Magnetic Resonance
Robert K. McMahan Jr. (53) Stellar Evolution and Cosmology

Professors Emeriti
Wayne A. Bowers
C. Victor Briscoe
Sang-Hi Choi
Morris S. Davis
J. Ross Macdonald
Eugen Merzbacher
Earl N. Mitchell
Everett D. Palmieri
Louis D. Roberts
Stephen M. Shafroth
Paul E. Shearin
Lawrence M. Slifkin
Joseph W. Straley
Max L. Swanson

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. 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 year 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 and includes a review of undergraduate physics. 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 pass an advanced laboratory or electronics course, in order to 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 a minimum of nine hours from ASTR 137, 241, 242, 243, 244, or 245.

The requirements for a Ph.D. in physics are: (a) A student must pass the following courses in the department, or have passed their equivalents elsewhere as an undergraduate or graduate student: 161, 169, 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 pass one of the electronics courses Physics 141 or 101-102; 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; and (c) 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 may be elected, in which case requirement (c) above is replaced by the requirement that the student pass at least five graduate-level courses selected from no more than two departments, with no fewer than two courses in either department. The minor program must be approved in advance by the minor department. Teaching experience, as part of professional training, is required of all doctoral candidates. This experience can be gained through laboratory or lecture instruction as a half-time teaching assistant either for two semesters or until teaching competence is acquired.

The astrophysics Ph.D. track requirements are similar, except that the course requirements include PHYS 160, 161, 163, 203, 204-205, 221, and ASTR 241, 242, 243, 244, 245. To gain familiarity with experimental astrophysics or observational astronomy, a student must either: pass one semester of PHYS 141, 201-202, or ASTR 137; or earn an M.S. degree which involves experimental or observational research in astrophysics; or perform other experimental/observational research deemed suitable by the director of Graduate Studies. The student must also pass two other courses appropriate to his or her field of specialization.

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 analyses and modeling are carried out using Morehead Observatory Sun workstations and University computers and supercomputers.

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 superlattices, amorphous materials, superconductors, the optical properties of solids, molecular properties at solid surfaces, defects and radiation damage in crystals, lattice dynamics, and the mechanism of photography. Among the techniques employed are ion implantation and ion beam analysis, NMR and EPR, Mössbauer spectroscopy and perturbed angular correlation, and Raman spectroscopy.

Field Theory, Particle Physics, Gravitation, and Relativity. Research includes gauge field theories, quantum chromodynamics, electroweak theory, grand unified theories, super symmetry, supergravity, Cauchy problem of general relativity, gravitational radiation, and the classical and quantum structure of gravitational fields.

Nuclear and Accelerator-Based Atomic Physics. Experimental nuclear and atomic physics is carried out using spin-polarized protons, neutrons and deuterons, heavy ions, X-rays, gamma rays, and a cryogenic polarized target. Experimental and theoretical research emphasizes using polarized beams in nuclear interaction studies, and inner-shell ionization phenomena in ion-atom collisions.

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, EPR, 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. Atomic and 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, 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 seven microVAX 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 (mathe-
ematics, physics, statistics, computer science, and operations
research) in Phillips Hall, which has 60,000 volumes and sub-
scribes to 200 physics and astronomy journals, and access to sev-
enteen 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 $10,800 for
nine months) are available to qualified graduate students. The
duties of assistants include supervising laboratory classes in ele-
mentary physics or astronomy, assisting in the supervision of
advanced laboratories, teaching recitation sections, and grading
papers. Graduate School fellowships, including a microelectron-
ics fellowship for first-year students, are available for well-quali-
fied 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 $14,400 for the calendar year. Summer employment is usually
available.

Application forms for admission, including graduate appoint-
ments, may be obtained 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 31.

**Courses for Graduates and Advanced
Undergraduates**

For courses with "staff" indicated as instructor, the name fol-
lowing in parentheses is that of a professor who can advise on
the course.

**Astronomy**

117* COSMIC EVOLUTION (3). Prerequisites, Mathematics 32 and
Astronomy 31 or 33 (or permission). A course in stellar and planetary
astrophysics with emphasis on astronomical conditions for the develop-
ment and sustenance of life. Fall or spring. Christiansen, staff.

137 OBSERVATIONAL ASTRONOMY (4). Prerequisites,
Astronomy 31 or 32, or permission of instructor. A course designed to
familiarize the student with observational techniques in optical and radio
astronomy, including application of photography, spectroscopy, photome-
try, 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 obser-
vational techniques, stellar structure and energy transport, nuclear energy
sources, evolution of the main-sequence, and supernovae. Fall. Carney,
Cecil, 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, Cecil,
Christiansen, Rose.

241 RADIATIVE PROCESSES IN ASTROPHYSICS (3).
Prerequisite, Physics 163 or equivalent. Stellar and physical parameters;
equation of transfer; continuous and line opacities; model atmospheres
(with detailed computer work); line absorption and broadening; curve of
growth; spectroscopy; elemental abundances; photoionization equilibria;
nebular abundances and conditions; H II regions; planetary nebulae.
Spring. Carney.

242 RADIO ASTROPHYSICS (3). Prerequisite, Physics 204; corequi-
site Physics 205. Synchrotron radiation; relativistic kinetic theory (parti-
cle acceleration mechanisms and energy loss mechanisms); radio source
structures (galactic nonthermal sources, extragalactic sources; jets); stellar
radio emission (flares, outflows, jets); molecular line emission (interstellar
clouds, protostellar bipolar outflows); cosmology. Fall. Christiansen.

243 STELLAR STRUCTURE AND EVOLUTION (3).
Prerequisite, Physics 203; corequisite, Physics 221. Thermodynamics of
stellar interiors; energy transport; thermonuclear reaction rates; major
evolutionary stages of stars; modeling stellar evolution (with numerical
experiments); brown dwarfs; degenerate stars; novae; supernovae. (Physics
161, Nuclear Physics, bears on this subject, and is required of the students,
but is not a necessary prerequisite.) Fall or spring. Carney, Champagne.

244 GALACTIC STRUCTURE (3). Corequisite, Physics 203. Spatial
distribution of stars and nebulae; age determinations; chemical com-
opositions; stellar dynamics; stellar populations, dark matter, mass models;
chemical and dynamical evolution of galaxies; interstellar medium; galac-
tic center, galactic mergers. Fall or spring. Rose.

245 EXTRAGALACTIC ASTROPHYSICS (3). Corequisite, Physics
203. Hubble law; morphology of galaxies (mass distributions, ages, dynami-
ces); clusters of galaxies; isotropy and voids; microwave background; large-
structure; Robertson-Walker metric; standard cosmology; Big Bang
nucleosynthesis; thermodynamics of expanding universe; inflation; forma-
tion of structure. Fall or spring. Cecil.

350 SEMINAR IN ASTROPHYSICS (1 or more). Recent observa-
tional and theoretical developments in stellar, galactic, and extragalactic
astrophysics. Fall and spring. Staff.

**Physics**

101 INTRODUCTORY ELECTRONICS I (3). Prerequisites, intro-
ductive physics and Mathematics 31, or permission of the instructor. This
course is designed to give students a sound working knowledge of basic
electronic principles. Physics 101 and 141 may not both be taken for
credit. Three lecture and three laboratory hours a week. Fall. (Laboratory
fee required.) Superfine.

102 INTRODUCTORY ELECTRONICS II (4). Prerequisite, Physics
101 or permission of the instructor. Digital electronics including Boolean
algebra, logic gates, flip-flops, counters, storage registers, ADCs, DACs,
and applications. An introduction to microprocessors. Three lecture and
three laboratory hours a week. Spring. (Fee required.) Superfine.

103 MECHANICS I† (3). Prerequisites, Physics 26 (or permission) and
Mathematics 33. Particle kinematics. Central forces, planetary motion.
Systems of particles and conservation laws. Statics. Motion of rigid bodi-

104 MECHANICS II† (3). Prerequisite, Physics 103. Deformable bod-
ies and wave motion Lagrange's and Hamilton's equations, Euler's equa-
tions, small oscillations, normal coordinates. Fall. Washburn.

Astronomy 117 is not to be taken for graduate credit by graduate
students in physics.

Physics 103-104 and 107-115 are not to be taken for graduate credit by graduate
students in physics.
105 HEAT AND THERMODYNAMICS (3). Prerequisites, Physics 27 (or 25 or 25c by permission) 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). 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. Ng.

113 SPACE AND TIME IN PHYSICS AND PHILOSOPHY† (Philosophy 121) (3). Contingent and necessary properties of space and time. The direction and flow of time. Fatalism. Effects preceding their causes. Spring. Van Dam, staff.

115 THE EVOLUTION OF PHYSICAL IDEAS IN THE TWELFTH CENTURY† (3). Prerequisites, Physics 25 and Mathematics 30 (or permission). The most important physical ideas and phenomena, discovered in the twelfth century, are studied by reading original papers or excerpts (in translation). These works are put in historical perspective. Spring. Staff.

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. Staff.

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. Kesemeier, staff. (Fee required.)

142, 143 INTERMEDIATE LABORATORY I AND II (2 each). Prerequisite, Physics 141 or permission. 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. Staff. (Fee required.)

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 microelectrography. Spring. Staff.


149 MATERIALS LABORATORY II (2). Prerequisite, Physics 148. Continuation of Physics 148 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. Staff.

151 FLUID DYNAMICS (Marine Sciences 151) (3). Prerequisite, Physics 103 or permission. The physical properties of fluids, kinematics, governing equations, viscous incompressible flow, vorticity dynamics, boundary layers, irrotational incompressible flow. Fall. Bane.


161 NUCLEAR PHYSICS (3). Prerequisite, Physics 160 or equivalent. Nuclear structure, nuclear reactions, experimental techniques of producing and studying nuclear particles; models of the nucleus; nuclear forces. Spring. Ludwig.

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, types of crystalline solids; electron and mechanical waves in crystals, electrical and magnetic properties of solids, semiconductors; low temperature phenomena; imperfections in nearly perfect crystals. Fall. Staff.

181, 182 ADVANCED LABORATORY (3 each). Prerequisite, Physics 103, 108, or permission. Six laboratory hours a week. Fall and spring. Staff. (Kesemeier.) (Fee required.)

191 MATHEMATICAL METHODS OF THEORETICAL PHYSICS I (3). Prerequisites, Physics 28, or equivalent; Mathematics 34. Vector fields, curvilinear coordinates, functions of complex variables, linear differential equations of second order, Fourier series, integral transforms. Fall. Hubbard.


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

201, 202 ADVANCED SPECTROSCOPIC TECHNIQUES (3 each). Prerequisite, Physics 103, 108, or permission. 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. Staff.


204 ELECTROMAGNETIC THEORY I (3). Prerequisites, Physics 191-192 or equivalent. Electrodynamics, magnetostatics, time-varying fields, Maxwell's equations. Fall. Hubbard.

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. Spring. York.

*The Physics 162 and Physics 380 sequence alternates with Physics 263-264.


260, 261 QUANTUM MECHANICS (3 each). Prerequisite, Physics 160 or equivalent. Review of nonrelativistic quantum mechanics. Spin, angular momentum, perturbation theory, scattering, identical particles, Hartree-Fock method, Dirac equation, radiation theory. Fall and spring. Frampton.

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, Frampton.

267 CURRENT ADVANCES IN PHYSICS (3). Prerequisite, permission. 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.


274 DIFFERENTIAL GEOMETRY IN MODERN PHYSICS (3). Prerequisites, Physics 203, 204, 205. Applications to electrodynamics, general relativity, and non-abelian gauge theories of differential geometry, including tensors, spinors, differential forms, connections and curvature, covariant exterior derivatives, and Lie derivatives. Either semester as announced. York.


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 topics of 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. Kesemeier.


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**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.

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. (Shafroth.)

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.

393 MASTER’S THESIS (3 or more). Either semester. Staff.

394 DOCTORAL DISSERTATION (3 or more). Either semester. Staff.

400 GENERAL REGISTRATION (0).

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**DEPARTMENT OF PHYSIOLOGY**

STANLEY C. FROEHNER, Chair

**Professors**


Frederic L. Eldridge (4) Respiratory Physiology, Neuropathophysiology of Respiratory Control

James E. Faber (49) Vascular Physiology, Signal Transduction and Gene Expression in Vascular Smooth Muscle and Microcirculation

Paul B. Farell (5) Regulation of Neuron Number, Development of Specific Neural Connections

Robert G. Faust (6) Mechanisms of Membrane Transport

Arthur L. Finn (35) Molecular Mechanisms of Chloride Transport in Epithelial Cells

Stanley C. Froehner (66) Molecular Neurobiology of Synaptic Formation and Function, Ion Channel Localization and the Cytoskeleton

Alan R. Light (32) Neurophysiology, Anatomy, and Pharmacology of Somatosensory Neurons

Pauline K. Lund (50) Growth Factors, Gastrointestinal Growth, Molecular Biology, Signal Transduction

David L. McCall (6) Chemistry of Spinal Motoneurons

Gerhard W. D. Meissner (26) Mechanisms in Excitation-Contraction Coupling in Muscle, Ion Channels

Gerry S. Oxford (36) Biophysics and Physiology of Excitable Cell Membranes Related to Neural and Endocrine Function

Edward R. Perl (18) Physiological and Molecular Bases of Pain and Other Somatic Sensations

Lola M. Reid (67) Synergies between Extracellular Matrix and Hormones in the Regulation of Gene Expression, Liver Stem Cell Biology

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Aldo Rustioni (30) Somatosensory System; Connections, Neurotransmitters, and Interneuronal Integration
Robert Sealock (32) Cell Biology and Biochemistry of the Neuromuscular Junction, Proteins Involved in Duchenne Muscular Dystrophy
Ann E. Stuart (41) Aspects of Synaptic Transmission from Photoreceptors, Histaminergic Synapses
Barry L. Whitel (23) Somatosensory Neurophysiology, Mechanisms of Somatic Sensibility

**Associate Professors**

Michael F. Goy (60) Biochemistry and Physiology of Excitable Cells, Second Messenger Mechanisms in Signal Transduction, Epithelial Biology
Enid R. Kafer (9) Neural Control of Respiration, Electrophysiology and the Effects of Anesthesia
Robert L. Rosenberg (63) Regulation of Ion Channels
Alan L. Wilhard (54) Developmental Neurobiology, Molecular Mechanisms of Neuramodulation

**Assistant Professors**

Richard E. Chenev (69) Cell Biology of Molecular Motors in Brain
Lian Li (70) Molecular Mechanisms of Synaptogenesis and Synaptic Transmission
Sharon L. Milgram (68) Protein Trafficking in Neuroendocrine Cells and Polarized Epithelial Cells, Biosynthesis and Posttranslational Processing of Bioactive Peptides

**Research Associate Professors**

C. William Davis (51) Epithelial Cell Physiology, Mechanisms and Regulation of Ion Transport and Macromolecule Secretion
Nicholas G. Moss (55) Renal Physiology, Neurophysiology, Micropuncture Techniques

**Adjunct Professors**

John A. Ciliolowski (48) Molecular Endocrinology: Mechanisms of Steroid Hormone Action; Programmed Cell Death (Apoptosis)
Kathleen C. Light (61) Behavioral Stress and the Cardiovascular System
James N. Weakly (22) Synaptic Transmission; Trophic Interactions between Nerve and Muscle; Clinical Research of Neuromuscular Blocking Agents

**Adjunct Associate Professor**

John C. Daw (3) Cardiac Metabolism

**Adjunct Assistant Professor**

Kay Waggoner (64) Structure-Activity Relationship of Ion Channel Gating and Permeability

**Professors Emeriti**

Carl W. Gottschalk
Joseph H. Perlmutt
Lloyd R. Yonce

Physiology is the study of the biological, chemical, and physical processes that underlie the functions of living cells and organs. Research in physiology uses tools from chemistry, mathematics, molecular biology, and physics to identify regulatory mechanisms that operate at levels of complexity ranging from the subcellular to the organismic.

**Curriculum**

The first two years of graduate study include core and elective course work and informal research discussion groups designed to develop good communication skills and critical analytical abilities. This training will help develop the research skills necessary to carry out successful dissertation research. Written and oral comprehensive examinations at the end of the first year test basic knowledge of physiology.

Students choose a dissertation committee to guide them in formulating a research proposal. This formal dissertation proposal is submitted to the dissertation committee as part of the specialty (second doctoral) exam. This exam tests breadth and depth of knowledge in the proposed area of research and is usually completed in the student's third year.

The doctoral adviser and committee will guide the student at each stage of the dissertation project. The student will acquire a professional level of competence in all aspects of research design and will become familiar with a specific field of research in order to identify significant unanswered scientific questions in that area, will develop testable hypotheses and experimental designs for those questions, and will acquire the necessary technical and analytical skills to conduct the experiments and interpret the results.

The dissertation project should be a significant contribution to the field of physiology and it must be successfully presented and defended at the final oral examination.

**Facilities**

The department has central facilities for cell culture, electron microscopy, histology, image analysis, molecular biology, and construction and repair of laboratory instruments. Faculty laboratories are equipped for research and training in all methods of biological research, including biophysics, molecular biology, biochemistry, immunocytochemistry, and whole-animal studies. Researchers in the department frequently collaborate with members of many other departments at The University of North Carolina and with laboratories at Duke University and in the Research Triangle Park.

**Financial Aid**

As a rule, the department offers stipends to all admitted students. Competitive University fellowships are available for qualified candidates and students are encouraged to apply for National Science Foundation and other predoctoral fellowships.

**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. All applicants are required to submit scores on the GRE aptitude and advanced subject tests, a written statement, transcripts, and a minimum of three letters of recommendation. Applications are welcome at any time, but must be received by December 15 to receive priority consideration for the fall semester. 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. Moss, 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, neurotransmitter factors, glial development, and the effects of experience. Spring. Lauder, Farel, Willard.

140 CELL AND ORGAN SYSTEM PHYSIOLOGY (Neurobiology 140) (5). Prerequisite. Biochemistry and permission of the instructor. This course covers the function of mammalian organs and the underlying electrical, mechanical, cellular, and molecular mechanisms in a lecture/recitation format. Audits welcome. Fall. Sealock, staff.

181 INFORMATION PROCESSING IN THE SOMATOSENSORY NERVOUS SYSTEM: EMPIRICAL AND THEORETICAL FOUNDATIONS (Neurobiology 181, Biomedical Engineering 181, Oral Biology 181) (3). Prerequisite, PHY1 140 or equivalent. Evaluation of the architecture and function of the somatosensory nervous system at multiple levels of analysis. Empirical and theoretical approaches currently used to study sensory information processing and representation will be considered. Fall. Whitmarch.

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 hybridization, gel analysis, Southern and Northern blotting, cloning in viruses and plasmids, and DNA sequencing. Fee required. Some scholarships available. Eight laboratory hours. Fall, spring, summer. Litaker.

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. Willard, 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. Faber, staff.

201 NEUROBIOLOGY (Neurobiology 210) (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.

202 ADVANCED CELLULAR PHYSIOLOGY (4). Prerequisites, Physiology 140 or equivalent and permission of the course director. Selected topics in cellular physiology, which may include membrane transport, cell volume regulation, the cytoplasmic matrix, molecular endocrinology, and gene expression, covered in depth through lectures, seminars, and demonstrations. (On demand.) Staff.

203 INTEGRATED SYSTEMS PHYSIOLOGY (4). Prerequisites, Physiology 140 or equivalent and permission of the course director. Selected topics in organ systems physiology which may include cardiovascular, renal, respiratory, endocrine, and gastrointestinal physiology, covered in depth through lectures, seminars, and demonstrations. (On demand.) Staff.

204 ADVANCED NEUROPHYSIOLOGY (Neurobiology 200) (5). Prerequisites, Physiology 140 or previous introductory course in neurobiology. Lecture/discussion course on aspects of neuronal function including ion and ligand-gated channels, membrane properties, neuronal signaling, synaptic transmission, plasticity and signal modulation, integration, and principles underlying sensory processing in the visual and auditory systems. Fall. Stuart, 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.

217 THE COMPUTER IN THE LABORATORY (3). Prerequisites, ability to program in a high-level language and permission of the instructor. Computer hardware, operating systems, and languages. Data collection and analysis, A/D conversion techniques, interfacing to laboratory instruments. Elementary waveform analysis. Computer control of experiments. Short programming exercises and semester project required. Two lecture and two laboratory hours a week. Fall. Staff.

220 SEMINAR IN PHYSIOLOGY (1). Prerequisite, permission of the departmental director of graduate studies. Weekly seminars emphasizing current literature. Fall. Stuart.

221 SEMINAR IN PHYSIOLOGY (1). Prerequisite, permission of the departmental director of graduate studies. Weekly seminars emphasizing current literature. Spring. Stuart.

222 CELLULAR AND MOLECULAR NEUROBIOLOGY I (Biochemistry 222, Pharmacology 222) (3-5). Prerequisite, permission of the instructor. Lecture/discussion course in 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. Stuart, Morrow, staff.

223 CELLULAR AND MOLECULAR NEUROBIOLOGY II (Biochemistry 223, Pharmacology 223) (2-3). Prerequisite, permission of the instructor. Lecture/discussion course in 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. Stuart, Morrow, staff.

224 PAIN AND SOMATIC SENSATION (Neurobiology 224) (2). Prerequisites, PHY1 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.

227 SPECIAL TOPICS IN PHYSIOLOGY (Biology 227) (3). Prerequisite, Biology 120 and/or permission of the instructor. Lecture and seminar consideration of selected advanced aspects of physiology. Topics vary from year to year. May be repeated for credit. Spring. Staff.

240 ADVANCED CONCEPTS IN PHYSIOLOGY (5). Prerequisites, PHY1 140 or equivalent and permission of the instructor. Advanced experimental concepts in the physiology of the neural, cardiovascular, renal, gastrointestinal, and endocrine systems at the cellular and molecular levels. Spring. Arendshorst, 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 trainees. 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.

400 GENERAL REGISTRATION (0).

DEPARTMENT OF POLITICAL SCIENCE

DONALD SEARING, Chair

Professors
Thad Beyle (3) State and Local, Policy Studies
Pamela Conover (10) Political Psychology, Mass Political Behavior, Public Opinion, Voting Behavior
Jonathan Hartlyn (46) Comparative Politics, Latin American Politics
Evelyne Huber (54) Comparative Politics, Political Economy, Latin American Politics
Michael Lienesch (38) History of Political Thought, American Political Theory
David Lowery (45) Urban Politics, State Politics, and Bureaucratic Politics
Duncan MacRae (21) Policy Analysis
Gary Marks (18) Comparative Politics, Western Europe
George Rahnowit (25) Social Statistics and Dimensional Analysis
Richard J. Richardson (26) Judicial Politics and Policy
Lars Schouls (20) Inter-American Relations, Latin American Politics
Joel Schwartz (28) Russian Politics and American Social Policy, Comparative Health Systems
Donald Searing (30) Comparative Politics, Political Psychology
Jurg Steiner (31) Comparative Politics, Ethics in Politics
John Stephens (55) Political Economy, Western Europe, Caribbean
James Stimson (65) American Politics, Political Methodology
James White (34) Comparative Politics, Urban Politics, East Asia-Japanese Politics
Dei S. Wright (37) Public Administration, Intergovernmental Relations, Organization Theory

Associate Professors
Stephen Leonard (15) History of Political Thought, Recent and Contemporary Political Theory, Critical Theory
Stuart Macdonald (39) Political Behavior, Public Opinion, Research Methods
Kevin McGuire (60) Judicial Politics, American Politics
Timothy McKeown (22) International Relations, International Political Economy
Catharine Newbury (24) African Politics, Comparative Politics
Jeffrey Obler (23) Political Theory and Public Policy
Terry Sullivan (47) Congressional and Executive Politics

Assistant Professors
Susan Bickford (58) History of Political Thought, Feminist Theory, and Democratic Theory
Stephen Biddle (64) International Relations, Security Studies
Barbara Hicks (53) Comparative Politics, Eastern Europe
Norman Hurley (63) American Politics, Mass Political Behavior, Political Psychology
Thomas Oatley (57) International Relations, International Political Economy, European Countries
Marco Steenbergen (61) Political Psychology, Public Opinion, Quantitative Methods

Professors Emeriti
Lee Bounds
Hsi Sheng Chi
Federico Gil
Donald Hayman
Lewis Lipsitz
Robert Rupen
Andrew Scott
Glenn Snyder

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 (excluding specialized programs described below), 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, and Methodology.

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 Graduate Certificate in Latin American Studies

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 any 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, (4) a thesis on a topic related to Latin America, and (5) an oral defense of the thesis. 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.

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 pollster Louis Harris 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 Louis Harris and Associates 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 both in terms of substantive findings and research methodology. Fall, spring.

114 COMPARATIVE EUROPEAN SOCIETIES (SCI 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.

118 POLITICAL ECONOMY II: THE INTERNATIONAL SYSTEM (3). Problems of the international economy in domestic politics. Advanced topics in the economic relations among capitalist nations; political power of multinational corporations. Spring. Staff.

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 regional 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 COLLAPSE OF COMMUNIST RULE IN THE U.S.S.R. AND EASTERN EUROPE (3). Looks at factors in the domestic, bloc, and international levels to evaluate competing explanations of the collapse of communist rule in the Soviet Union and Eastern Europe. Fall. Hicks.

122 POLITICS AND SOCIETY IN THE UNITED STATES AND THE SOVIET UNION (3). Prerequisite, Political Science 55 or equivalent, History 31, Economics 168, or Sociology 152. An examination of selected aspects of politics and society in the United States and the U.S.S.R., focusing upon differences and similarities and their underlying causes. Fall. Schwartz.

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 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. Newbury.

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. Hartlyn, 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. Hartlyn.

128 EUROPEAN POLITICS (3). Prerequisite, Political Science 52. Deals with the major and some of the smaller European countries. Discussion of current events; theoretical work; partly in small groups. 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.


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. Keech.

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 political 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 South in presidential elections and the roles played by 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 presents students with background in history, security, or international relations. Spring. Mlyn.

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. McKown.

141 THEORIES OF WAR AND PEACE (3) (PWAD 141). Prerequisite, Political Science 86 or permission of the instructor. Theories of international relations, with emphasis on the role of force, causes of conflict, and conditions of cooperation. Staff.

142 QUANTITATIVE INTERNATIONAL RELATIONS (3). Prerequisite, Political Science 86 or permission of the instructor. The use of quantitative theory, methods, and data in analyzing international relations and forecasting conflict and cooperations. Staff.
POLITICAL SCIENCE 241

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. Mlyn.

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 external environment and domestic politics on the White House and Department of State. Mlyn.

146 INTERNATIONAL COMMUNICATIONS AND COMPARATIVE JOURNALISM (JOUR 146) (3). Fall, spring. Cole.

147 CONTEMPORARY INTER-AMERICAN RELATIONS (PWAD 147) (3). Prerequisite, Political Science 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 upon 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. Mlyn.

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. Richardson.

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 and the impact following Supreme Court decisions. Fall. Staff.

156 JUNIOR/SENIOR SEMINAR IN LAW AND JUSTICE (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. Staff.

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. Staff.

158 THE PROBLEMS OF CHANGE IN CORRECTIONAL ADMINISTRATION (3). An 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. Olber.

162 AMERICAN POLITICAL THOUGHT (3). A historical and analytical examination of the ideas underlying the political culture and institutions of the United States. Spring. Lienesch.

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. Keech.

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, Waltzer, Habermas, and Gadamer. Fall or spring. Leonard.


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. Schwartz.

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 (PUPA 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. Munger.

176 INTERNATIONAL LAW (3). Prerequisite, Political Science 86 or permission of the instructor. The place of international law in the international political system; traditional substantive issues (e.g., recognition, laws of war, intervention); selected new issues; hypothetical cases/problems. Staff.

179 SCIENCE AND POLICY (SOCI 133) (PUPA 179) (3). The problems of using expert knowledge in democratic policy formation. These relate to communication within scientific disciplines; scientists' values; and the use of scientific information and personnel in decision making. Fall and spring. MacRae, Schroeder.

180 FORMAL MODELS OF POLITICAL SYSTEM (3). An introduction to the use of mathematical models for analyzing political behavior. Fall and spring. McKown.

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 PRINCIPLES AND PROBLEMS OF POLITICAL INQUIRY (3). Prerequisite, permission of the instructor. A consideration of the theory and process of political analysis including philosophy of science, research design, the methods of drawing causal inferences, and of generating and analyzing data. Fall and spring. White.

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 (PUPA 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. MacRae.

206 INTERVIEWING IN SOCIAL SCIENCE RESEARCH (3). This 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 interviewing. Fall. Staff.

208 ANALYSIS FOR RISK MANAGEMENT (ENVR 258) (3). 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 (PUPA 210) (PADM 210) (3). Exposition, comparison, and case-based application(s) of basic models of organizations, with emphasis on public sector entities. Fall, Wright.

211 PUBLIC MANAGEMENT AND LEADERSHIP (PUPA 211) (PADM 211) (3). 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. Staff.

212 INTRODUCTORY POLICY EVALUATION METHODS (PUPA 212) (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. Lowery, Whittaker.

212L COMPUTER METHODS FOR STATISTICAL ANALYSIS LAB (PADM 212L) (1). Teaches computer methods including Lotus 1-2-3. Must be taken concurrently with Political Science 212. Fall. Staff.

213 MANAGING PUBLIC POLICY (PADM 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. Wright.

214 GOVERNMENT BUDGETING AND FINANCE (PUPA 214) (PADM 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.

217 M.P.A. PROFESSIONAL DEVELOPMENT SEMINAR I (PADM 217) (2). Integration of learnings from M.P.A. students' professional field experience ("internship") through site visits, conferences, and seminars. Fall. Staff.

218 M.P.A. PROFESSIONAL DEVELOPMENT SEMINAR II (PADM 218) (2). Continued integration of learnings from M.P.A. students' professional field experience ("internship") through site visits, conferences, and seminars. Spring. Staff.

219 POLITICS OF THE ADMINISTRATIVE PROCESS (PUPA 219) (PADM 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.

220 THE POLITICS OF DEVELOPMENT AND CHANGE (3). Prerequisite, permission of the instructor. The theories, concepts, and mechanisms of political change, with particular attention to processes of development and modernization in new nations of Africa, Asia, and Latin America. Newbury, Hartlyn.

221 PUBLIC POLICY AND ADMINISTRATION (PUPA 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. MacRae, Wright.

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 or spring. Schwartz.

227 ISSUES IN LATIN AMERICAN POLITICS (3). Explores the central issues of Latin American politics and analyzes major theoretical debates. Fall or spring. Huber, Hartlyn.

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. Hartlyn, 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. Hartlyn, 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 (PUPA 237, PADM 237, and SOCI 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, Manger.

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 I (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, Mlyn.

241 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.

242 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.

243 INTERNATIONAL ORGANIZATION (3). Theories and approaches to the study of international organizations and regimes, plus selected noneconomic case studies. Staff.

244 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. Mlyn.


246 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. Schollz.

247 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.

248 INTRODUCTION TO MATHEMATICAL INTERNATIONAL RELATIONS (3). Surveys research in mathematical models of international decision making, bargaining, systemic change, arms races, coalitions, and perception. Philosophical and historical considerations about this field are also discussed.

249 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.

250 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. Mlyn.

252 POWER AND MORALITY IN POLITICS (3). Motives of power and morality in rational choice theories and theories of power sharing. Empirical findings and normative evaluations. Spring. Steiner.

253 JUDICIAL PROCESS (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. Richardson.

255 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.

256 SECURITY STUDIES (3). This course introduces students to the major theoretical approaches to the study of national security. Fall, spring. Mlyn.

257 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. Mlyn.

260 LOGIC OF POLITICAL INQUIRY (3). A critical examination of models of political inquiry. Empirical (naturalist), interpretive, and critical metaphysics are considered in terms of each model's ontological, epistemological, and practical/political consequences and presuppositions. Fall or spring. Leonard.
261 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, Lienesch, Olber.

262 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. Lienesch.

263 CLASSICAL POLITICAL THEORY (3). An introduction to ancient and medieval political thought, its major thinkers and issues. Leonard, Lienesch.

264 MODERN POLITICAL THEORY (3). An introduction to modern political thought, its major thinkers and issues. Fall or spring. Leonard, Lienesch.

265 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-Marxism, critical theory, existentialism, structuralism, post-structuralism. Leonard.

266 FEMINISM, POLITICS, AND INQUIRY (WMST 266) (3). A survey of feminist approaches to politics and political inquiry. Fall and spring. Bickford, Conover, Leonard.

267 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, Lienesch.

268 INFLUENTIAL WORKS IN DEMOCRAČY (SOCL 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.

270 PUBLIC OPINION (3). A study of public opinion, its formation, expression, and impact on political systems and public policy.

271 DYNAMICS OF ELECTORAL POLITICS (3). Change within mass electorates. Topics include issue and attitude change, political realignments, and models of electoral competition. Rabinowitz.

272 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.

273 COMPARATIVE POLITICAL ECONOMY (3). Examines topics in the comparative political economy of Western Europe such as neocorporatism, postindustrialism, the politics of industrial relations, and the European community. Fall. Marks.

275 POLITICAL PARTIES (3). Selected problems and issues in the study of American and comparative parties and party systems. Staff.

276 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.

280 LEGISLATIVE SYSTEMS (3). Institutions and processes in the United States Congress with some cross-national comparisons. Staff.

281 STATISTICS (3). Elementary descriptive statistics and basic principles of statistical inference including estimation and tests of hypotheses. Fall. Rabinowitz.

282 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. Rabinowitz.

283 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. Munger.

285 AMERICAN PRESIDENCY (3). Survey of the substantial literature and research on the American Presidency. Staff.

289 CONGRESS AND THEORY BUILDING (3). This course examines diverse theoretical perspectives on national institutional change, stability, and as an institutional focus the United States Congress between 1789 and 1899. 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 role of peasants and women in politics, and prospects for democratization. Fall. Newbury.

291 POLITICAL TRANSITIONS AND DEMOCRATIZATION IN COMPARATIVE PERSPECTIVE (3). Examination of contrasting theoretical approaches to understanding democracy. Comparative study of Africa, Eastern Europe, and Latin America elucidates challenges and opportunities that affect possibilities for democratization and consolidation. Fall, spring. Hartlyn, Hicks, 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.

293 PSYCHOLOGY OF ELITE DECISION MAKING (3). Political thinking of politicians and civil servants in domestic and foreign policy. Perception, cognition, learning, attitude change and persuasion, aging, motivation, emotions, and personality. 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, information processing, decision making, political identity, and political affect. Spring. Steenbergen, Hurley.

300 POLITICAL SCIENCE RESEARCH (3). Permission of the instructor required. Presentation of theory, method, and data analysis in political science research reports. 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. McKeown, Mlyn.

303 THEORIES OF INTERNATIONAL POLITICS (3). Topics relating to the development of theory in the realm of international politics.
305 SEMINAR ON APPLICATION OF政 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. Beye.

311 SEMINAR IN POLITICAL SOCIOLOGY (SOCL 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. MacRae.

321 SEMINAR IN AMERICAN GOVERNMENT AND POLITICS (3). Fall. Beye.

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. Cole.

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, Lienesch.

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 MASTER’S 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) (0-6). Fall, spring, and summer. Staff.

400 GENERAL REGISTRATION (0).

DEPARTMENT OF PSYCHOLOGY

BERNADETTE GRAY-LITTLE, Chair

Professors

George Baroff (2) Mental Retardation
Donald H. Buxon (104) Sex Roles, Marital Therapy, Depression Assessment
Robert B. Cairns (4) Social and Genetic Determinants of Aggression, the Origins and Plasticity of Interchanges
Dianne L. Chambers (180) Anxiety Disorders, Psychotherapy Research, Cognitive Behavior Therapy
Linda A. Dykstra (9) Behavioral Pharmacology, Stimulus Control Processes
David A. Eckerman (10) Operant Conditioning, Learning Theory, Behavioral Toxicology
Samuel Fischelbaum (13) Psychology of Language

Bernadette Gray-Little (16) Sociocultural Influences on Personality, Marital Interaction, Psychopathology
Mark Hollins (17) Sensory Information Processing, Tactile Perception
Chester A. Inako (18) Attitude Change, Balance Theory, Individual-Group Discontinuity
Edward S. Johnson (19) Human Problem Solving, Spatial Ability, Cognitive Sex Differences
Peter A. Ornstein (28) Cognitive Development, Development of Learning and Memory
Caryl E. Ruschel (129) Social Interdependence, Close Relationships, Organizational Behavior
Eric Schopfer (49) Autism and Developmental Disorders
Paul G. Shinkman (33) Effects of Early Experience on Vision and Visual Neurophysiology
David M. Thiessen (157) Psychometrics, Item Response Theory, Statistical Models for Developmental Data, Graphical Data Analysis
Vaida D. Thompson (36) Attitudes, Individual-Family Processes
Thomas S. Wallsten (38) Individual Decision Behavior, Measurement and Communication of Uncertainty, Judgment Under Uncertainty
Forrest W. Young (41) Cognitive Bases of Computer Interfaces

Associate Professors

Frank J. Floyd (172) Family and Couple Processes from a Cognitive Behavioral Perspective
Jean-Louis Garry (153) Development and Evolution of Social Behavior, Early Social Development in Children, Quantification of Social Networks
Karen M. Gil (181) Chronic Illness, Stress and Coping, Pain Management
Peter C. Gordon (170) Psychological Processes Underlying Our Use of Language
Marilyn D. Hartman (132) Neuropsychology, Gerontology with Special Emphasis on Alzheimer’s Disease and Other Dementias
Elliot L. Hinshman (140) Human Memory, Connectionist Modeling
Janis B. Kupersmidt (133) Children’s Peer Status, Adjustment of Rejected and Aggressive Children
Beth E. Kurtz-Costes (142) Cognitive Development, Including Educational and Cross-Cultural Implications
Donald T. Lyle (155) Psychoneuroimmunology, Learning Theory, Comparative Animal Behavior
Abigail T. Panter (144) Item Response Models, Latent Variable Models, Individual Differences in Cognitive Processing, Nonverbal Communication, Psychology of Gender Differences
Mitchell J. Picker (131) Discriminate Properties, Tolerance and Cross-Tolerance, and Behavioral Effects of Opioid and Neuroleptic Drugs
Constantine Sedikides (171) The Self-Concept, Intergroup Perception

Assistant Professors

Ute J. Bayen (184) Human Memory, Memory and Aging, Cognitive Aging
Regina M. Carelli (187) Neurobiology of Reward, Drug Abuse, Behavioral Neuropysihology
Andrea M. Husson (188) Adolescent Substance Use, Models of Peer Risk
Stephanie J. Rowley (189) Social Personality Development and Academic Achievement Especially with African American Children
Jack L. Vevea (182) Meta-analysis, Multivariate Statistics
Yiu-Fai Yung (174) Psychometrics, Covariance Structure Analysis, Multivariate Analysis
Research Professors
Alan J. Goldstein (183) Anxiety Disorders, Behavior Therapy, Eye-Movement De-sensitization/Reprocessing
Kathleen C. Light (147) Behavioral Medicine
Robert W. Peters (163) Psychoacoustics, Speech Perception, Stuttering
Rune J. Simeksson (164) Social/Cognitive Development, Child Development Research, Psychological Assessment

Research Associate Professors
Brenda M. DeVellis (160) Health Education Research, Health Behavior, Patient Education
Robert F. DeVellis (161) Health Psychology, Measurement
Betty N. Gordon (127) Developmental Disabilities, Child Sexual Abuse, Pediatric Psychology

Research Assistant Professor
Susan Girdler (191) Behavioral Medicine

Clinical Professors
William V. Burlingame (66) Psychotherapy, Residential Treatment of Adolescents
Gary B. Mesheov (94) Normalization and Community Programs for Handicapped People, Normal Social and Personality Development

Clinical Associate Professors
Ann Louise Barrick (135) Geropsychology, Behavioral Interventions in Penahal Care in Dementia
Paul M. Bricht (152) Child Psychotherapy, Psychological Adjustment of Handicapped Children, Psychoanalytic Theory
Stephen G. Flanagan (130) Chronic Mental Illness, Behavior Therapy
Arlene Margolis (134) Women's Health, Child and Adolescent Psychology
Paul N. Mermin (118) Assessment and Therapy of Children and Families, Family Development

Clinical Assistant Professors
Laura Clark (179) Neuropsychological Changes, Disruptive Behavior, Psychotic Symptoms in Persons with Alzheimer's Disease
Madeleine Crocket (176) HIV Risk Factors, Violence and Mental Illness
Anthony D. Dauro (185) Couple and Family Interventions for Individual Psychopathology, In-patient Assessment and Treatment of Severe Mental Illness
D. Michael Glenn (186) Parent-Adolescent Relationships, Adolescent Psychopathology, Sleep Disorders
Mareah Steketee (178) Neurocognitive Functioning and Treatment, HIV, Adult Onset Brain Tumor, Memory and Depression

Adjunct Associate Professor
Mark E. Stanton (137) Developmental Psychobiology, Developmental Neurotoxicology, Ontogeny of Learning and Memory Processes

Adjunct Assistant Professor
Josephine Johns (190) Comparative Animal Behavior, Substance Abuse and Aggression, Neuroendocrinology

Professors Emeriti
John B. Carroll
Elliot M. Cramer
W. Grant Dahlstrom
M. David Galinsky
Lyle V. Jones
Richard A. King
Eugene R. Long
Barclay Martin
Harriet Rheingold

The department 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 writing 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 adviser. 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.

100 THINKING AND COGNITION (3). Prerequisite, Psychology 10. Considers problems in intelligence, concept formation, problem-solving, and thinking. Emphasis is on an examination of the experimental literature with attention to recent developments in information processing models and computer simulation. 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 to evaluate, integrate, and summarize significant original literature. Fall. Eckerman.

102 BIOLOGICAL FOUNDATIONS OF BEHAVIOR (Neurobiology 102) (3). Prerequisite, Psychology 22 or Biology 11. Ethological, genetic, and physiological variables are studied in relation to their behavioral effects. Fall, Garvey; Spring, 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. Wallsten.
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. Fall and 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 behavior and conscious experience. Fall and spring. King.

109 APPLIED BEHAVIORAL ANALYSIS (3). Prerequisites, 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. Spring. Staff.

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.) Fillenbaum.

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.” Fall. Hollins.

121 ADVANCED PERCEPTUAL PROCESSES (3). Prerequisites, Psychology 20, 21, or 23. The perception of shape, space, and motion; also, the role of past experience, set, and motivation in perception. (As announced.) Hollins.

122 HUMAN MEMORY (3). Prerequisite, Psychology 20 or 22. Theoretical and applied issues in human memory. Fall and spring. Byer, Hinham.

124 PSYCHOLOGICAL APPLICATIONS OF DRUGS (3). Prerequisites, Psychology 22 and 80. This course investigates the pharmacological effects and the clinical efficacy of drugs used to treat behavior disorders. Fall. Picker.

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. Fall. Fillenbaum, P. Gordon.


129 DEVELOPMENT OF SOCIAL BEHAVIOR AND PERSONALITY (3). Prerequisites, Psychology 24, 28, and 30. Developmental processes during early childhood as they relate to social behavior and personality. Fall and spring. Cairns, Gairney.


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. Spring. Wallsten.

140 ADVANCED PERSONALITY (3). Prerequisite, Psychology 28 or graduate standing. An in-depth analysis of major theoretical issues in personality study. Fall and spring. 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-Little.

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 disordered behavior, and an examination of major child and adolescent behavior problems and clinical syndromes. Fall and spring. Kupersmidt, Margolis, Wiss.

145 HEALTH PSYCHOLOGY (3). Prerequisite, Psychology 50 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, Steketee.

146 BEHAVIOR AND THE BRAIN: INTRODUCTION TO NEUROPSYCHOLOGY (3). Prerequisites, Psychology 20 and 23 or permission of the instructor. 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 disease 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 issues and instruments used in assessing intellectual functioning, educational progress, personality, and personnel selection. Spring. 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 includes practicum experience with youth. Fall, spring. Kupersmidt.

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, Hartagan. Spring, Barrick.

153 ATYPICAL PERSONALITIES AND GROUPS II (3). Prerequisite, Psychology 152. This course studies persons and groups labeled as different, outsiders, deviant, stigmatized, or occupying disvalued roles. Focus is placed on how these individuals present themselves in person and writing. Spring. Staff.
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. Cairns, Ornstein.

171 DEVELOPMENT OF BLACK CHILDREN (3). Prerequisite, Psychology 24. A survey of the literature on the development of black children. Topics include prenatal development, intelligence, black dialect, socialization, family issues, and school achievement. Psychology 30 recommended. As announced. Fall, spring. Staff.

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. Kurtz-Costes.

180 INTRODUCTION TO THE STUDY OF EXCEPTIONAL CHILDREN (3). Prerequisite, Psychology 28 or equivalent. Overview of mental retardation, autism, and learning disabilities; students devote some time each week to working with a handicapped child in addition to the regular class meetings. Spring. Baroff.

183 CONTEMPORARY SEX ROLES (Women's Studies 183) (3). Prerequisite, Psychology 10. Covers theories and research in the areas of constitutional and social learning influences 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. Mangolis or staff.


186 NONVIOLENT CONFLICT RESOLUTION (P.W.A.D. 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, intergroup, and interethnic conflict, with a focus on empirical knowledge and acquisition of skills for nonviolent dispute resolution. Fall. Scholper.

187 APPLIED SOCIAL PSYCHOLOGY (3). Prerequisites, Psychology 30 and 33. Applications of social psychological theory to research in social problems and issues, e.g., organizational behavior, job satisfaction, effects of advertising and media on behavior, and discrimination-affirmative action. Spring. 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. Scholper, Thompson.

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. Rubult 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. Fall. Sedikides.

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. Dykstra, Light, Lyle, MacPhail, Picker.

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) practical in Quantitative Psychology research, (E) computer simulation methods, (F) test theory. Fall. Staff.

209 A, B, C, D, E, F 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) methodology. A-C fall, D-F spring. 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. Fall. King.

212 CONTEMPORARY PSYCHOLOGICAL TRENDS (3). Prerequisite, graduate standing. Different perspectives on the task of psychology with a discussion of selected contemporary problems. Fall. Fillenbaum.

216, 217 DEVELOPMENTAL PSYCHOLOGY: EXPERIMENTAL METHODS (3). Techniques and research designs appropriate for the study of the development of behavior. Supervised experience in the planning of experiments and data analysis. Ten laboratory hours a week. (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). Prerequisite, 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 the instructor. Intensive study of the processes by which adult close relationships are initiated and developed. Fall. Rusby.

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. Wallsten.

227 INTRODUCTION TO CLINICAL PSYCHOLOGY (3). Prerequisite, graduate standing. Survey of methods and findings in psychodiagnosis, psychotherapy, and mental health practices. (As announced.) Staff.

228 ADVANCED SOCIAL PSYCHOLOGY (3). Prerequisite, Psychology 238 or permission of the instructor. Intensive study of interdependence theory and research of interpersonal relationships. Spring. Schopker.

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.) Young.

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 upon 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.) Wallsten.

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. (As announced.) 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.) Yung.

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. Schopker.

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.) Young.

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 WAIS-WISC, Rorschach, TAT, and MMPI. Two lecture 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. Burlingame, Gray-Little, Mann.

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.

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. Baucom.

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. Kupermidt.
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. Kupensmidt 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 nonequivalence designs. Spring. Staff.

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. Baucom.

270 MEASUREMENTS OF LANGUAGE BEHAVIOR (3). Prerequisite, permission of the instructor. Procedures for the quantitative treatment of language elements (words, text content, etc.) and performance (e.g., speech rate, language acquisition, vocabulary, comprehension, verbal aptitude). (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, Garvey.

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.

276 QUANTITATIVE METHODS FOR OBSERVING BEHAVIOR (3). Techniques for collecting behavioral observations including the development of coding systems, reliability and validity, and interface with theory. Students design a study, collect and analyze data, and interpret results. Fall. Staff.

277 CULTURE AND HUMAN DEVELOPMENT (3). Prerequisite, graduate standing. Focus on how varied cultural conditions provide the social basis for human affective, social, and cognitive development. Integration of cross-cultural psychology and anthropology with development psychology. (As announced.) Kurtz-Costes.

278 DEVELOPMENTAL 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.) Cairns, Ornstein.

279 ADVANCED FAMILY THEORY AND RESEARCH (3). Research related to family processes, especially regarding the developmental consequences of varying family environments on children. Topics include divorce, cognitive development, single parents, parental employment, discipline, cultural context. (As announced.) Kurtz-Costes.

280 DEVELOPMENTAL METHODOLOGY (3). Methodological issues of common concern in the study of developmental phenomena. Particular emphasis is placed on the articulation between developmental theory and method. Fall. Staff.

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.) Yung.

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 statistical computing and dynamic statistical graphics. Fall. Young.

286 DEVELOPMENTAL PSYCOBIOLOGY (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.) Garvey.

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.) Burbeck, Marshall, Pizer.
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. Hirshman.


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 interests 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. King.

304 SEMINAR IN GENERAL PSYCHOLOGY (3). Limited to graduate students in Psychology. Selected advanced topics depending on the interests of the instructor and students. Three to six hours a week. Fall and spring. Staff.

305 SEMINAR IN THEORIES AND METHODS IN DEVELOPMENTAL PSYCHOLOGY (3). Prerequisite, permission of the instructor. Selected topics in developmental theory and methodology. (As announced.) 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 TOPICS IN HUMAN DEVELOPMENT (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 staff. Fall and spring. Cairns, Kupersmidt, Ornstein.

316 SEMINAR IN EXPERIMENTAL CHILD PSYCHOLOGY (3). Prerequisite, permission of the instructor. Intensive study of selected topics in experimental child psychology. (As announced.) Staff.

320 SEMINAR IN PERSONALITY (3). Prerequisite, permission of the instructor. Selected advanced topics depending on the interests 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. Lysle, Light.

322 SEMINAR IN CLINICAL HEALTH PSYCHOLOGY (3). An in-depth analysis of biopsychosocial variables in health and illness with an emphasis on the clinical and developmental aspects of health psychology. Spring. Gil.

323 BEHAVIORAL PHARMACOLOGY (Neurobiology 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, Picker.

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. Dykstra, 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. (As announced.) 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 presentational 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. Staff.

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.

400 GENERAL REGISTRATION (0).

MASTER OF PUBLIC ADMINISTRATION DEGREE PROGRAM

STEPHEN ALLRED, Director

Professors
Stephen Allred (1) Public Personnel Law, Administrative Law
A. Fleming Bell II (3) Local Government, Ethics
David D. Dill, Public Policy Analysis
A. John Vogt (6) Public Financial Management
Gordon P. Whitaker (36) Public Management, Organizational Theory
Deil S. Wright (37) Intergovernmental Relations, Organizational Theory, Public Management
Associate Professors
David N. Ammons (2) Research Methodology, Local Government Productivity
Kurt J. Jenne (5) Public Management
Michael Luger (38) Public Policy Analysis, Infrastructure and Urban Services, Economics
David Owens (7) Environmental Law, Administrative Law

Assistant Professors
Margaret S. Carlson (4) Public Management, Organizational Theory
John B. Stephens, Dispute Resolution and Consensus Building

Lecturers
Gregory S. Allison, Accounting
Gustavo Fernandez, Statistical Methods
Theresa L. Kale, Information Technology
Tema Okun, Nonprofit Management
Terry Roberts, Communications
Robert Ward, Local Government Law

Program Overview
The University of North Carolina at Chapel Hill offers a two-year graduate program leading to the M.P.A. degree. The aim of the program is to provide professional education for careers of leadership in public service. The M.P.A. program is administered by the Institute of Government with the support of the Department of Political Science. The M.P.A. program is accredited by the National Association of Schools of Public Affairs and Administration.

The courses of study for the M.P.A. provide preparation for careers in local government, federal, state, and nonprofit agencies. 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 female and minority applicants.

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. Minorities have comprised substantial portions of each class.

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;
- 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. The GRE should be taken in October or December. Application blanks may be requested from the Graduate School, CB# 4010 Bynum Hall. 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. Also, nonresidents who have special skills as research assistants may qualify to pay tuition at the in-state rates. Loans are available on the student's own initiative from the Insured Student Loan Program. Information about this program is available from the Office of Scholarships and Student Aid, 300 Vance Hall, PO. Box 1080.

Several types of financial aid are available through the M.P.A. program:
- M.P.A. Alumni Association scholarships;
- 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;
- Contract Management Scholarship, granted by the Research Triangle Chapter of the National Contract Management Association;
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.

Research assistantships;

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 Fund Scholarships, awarded in memory of Dr. Mengel, who taught professional communication in the M.P.A. program for years. The fund was created by her family in 1997.

Prospects for financial assistance are improved if applications are received early.

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.

Course requirements are:

- Public Organization Theory and Behavior (3).
- Introductory Policy Evaluation Methods (3).
- Professional Communication (3).
- Politics of the Administrative Process (3).
- Computer Methods for Statistical Analysis Lab (1).
- Public Management and Leadership (3).
- Methods for Policy Analysis and Evaluation (3).
- Public Personnel Law and Administration (3).
- Government Budgeting and Finance (3).
- Governmental Accounting (1).
- 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) (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.

210 PUBLIC ORGANIZATION THEORY AND BEHAVIOR (POLI 210) (PUPA 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 (POLI 211) (PUPA 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, Carlson.

212 INTRODUCTORY POLICY EVALUATION METHODS (POLI 212) (PUPA 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.

212L COMPUTER METHODS FOR STATISTICAL ANALYSIS LAB (POLI 212L) (PUPA 212L) (1). Required for students taking PAD 212. Teaches computer methods. Must be taken concurrently with PAD 212. Fall. Kale.

213 MANAGING PUBLIC POLICY (POLI 213) (3). Prerequisite 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 (POLI 214) (PUPA 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, Vogt.

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. Okun.

216 LEGAL ISSUES IN STATE/LINEAL GOVERNMENT (3). Substantive law applied to all aspects of governmental and administrative operations in state and local government. Topics include: state/local relations; government structures; liabilities of officials; and financial and regulatory activities. Fall. Ward.

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. Allred.

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. Allred.
219 POLITICS OF THE ADMINISTRATIVE PROCESS (POLI 219) (PUPA 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, Lowery.


223 ADMINISTRATIVE LAW DEVELOPMENT AND APPLICATIONS (3). Analysis of problems in defining, invoking, and applying administrative law at the national and state level; rule making, administrative 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. Spring. 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. Spring. Jenne.


227 GOVERNMENTAL AND NOT-FOR-PROFIT ACCOUNTING AND REPORTING (1). 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. Roberts.


237 METHODS FOR POLICY ANALYSIS AND EVALUATION (POLI 237, PUPA 237, and SOCI 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. Staff.

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 areas of public administration. Topics will vary from year to year. May be repeated for credit. 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. Staff.

395 RESEARCH IN PUBLIC ADMINISTRATION (POLI 395). (0-6). Fall, spring, and summer. Staff.

SCHOOL OF PUBLIC HEALTH

WILLIAM L. ROPER, Dean
Allan B. Steckler, Associate Dean for Academic Programs

Organized in 1936 as a division of the School of Medicine, the School of Public Health at The University of North Carolina at Chapel Hill was awarded separate status three years later. It was the fourth school of public health established in the United States and the first in a state university. Today, it is one of twenty-seven such schools in the nation accredited by the Council on Education for Public Health. The School of Public Health is one of five schools comprising the UNC-Chapel Hill Division of Health Affairs.

The mission of the school is to improve the health and well-being of the population. This mission is accomplished through the interaction of:

- Teaching—to educate students for 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, and Public Health Leadership. All have graduate degree programs, four of which are open to undergraduates.

The Public Health Leadership Program is a dedicated educational program transcending the existing departments within the School of Public Health, yet building on their respective areas of expertise to provide an integrated curriculum for individuals desiring generalist training in public health. This program has three degrees: an M.P.H. spanning three different concentrations (generalist — both distance learning and residential; health care and prevention; and public/occupational health nursing); an M.S. in public/occupational health nursing; and a Dr.P.H. degree in public health leadership.

Interdisciplinary programs that provide opportunities for students in education, service, and research include: UNC 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 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 M.P.H. program is designed to prepare students for positions requiring a considerable breadth of knowledge of the field of public health and a lesser degree of specialization in one area. Students in this program may take approximately 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 will have already acquired education in a health or health-related profession or have at least three years of experience in a field germane to public health. The M.P.H. is predominantly a terminal degree, but qualified students may proceed in the School of Public Health to a Dr.P.H. program for advanced study.

M.S.P.H. Program

The M.S.P.H. program is designed to prepare students for professional careers in specialized areas of public health. Students take courses mainly in one major department or curriculum of the school, although there are also core requirements that provide for orientation to a broader view of public health. The Master of Science in Public Health is usually a terminal degree, but it and the Master of Science degree, more 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 M.H.A. program in the Health Policy and Administration Department 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 the M.S. degree are offered in Biostatistics, Environmental Sciences and Engineering, and Public Health Nursing. Master of Science degree requirements are regulated by the UNC-Chapel Hill Graduate School and are explained in detail in the “School Handbook” distributed to all students.

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 Health Policy and Administration Department 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 transfers from approved programs at other universities. Students usually complete the M.P.H. degree requirements within two years, the M.H.A. in three.

Program information and an application may be obtained by calling (919) 966-7364 or (919) 966-7359, or write: The Executive Master’s Degree Program, Department of Health Policy and Administration, School of Public Health, CB# 7400, McGavran-Greenberg Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7400.

Dr.P.H. Program

The Dr.P.H. program provides professional training to prepare persons for the effective conduct or supervision of 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 as directors of community or public health programs at the local, state, national, or international levels.

Ph.D. Degree

The Ph.D. degree prepares students for leadership in academic and related settings involving teaching and research with emphasis on applied or theoretical issues. Graduates are typically
employed by universities or other organizations conducting research. This degree is offered by the departments of Biostatistics, Environmental Sciences and Engineering, Health Behavior and Health Education, Health Policy and Administration, 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**

Joint degree programs are offered in certain departments of the School of Public Health in conjunction with the Schools of Business, Medicine, Law, and Social Work. Under the joint degree arrangement, a student may be able to earn two professional degrees in a period of time less than the total required by the two degrees separately.

Close affiliations are maintained with other graduate schools and departments of The University of North Carolina campuses as well as with other schools and universities, health and human services, and research organizations. These affiliations are local, statewide, national, and international in scope. They include joint sponsorship and effort in teaching and research programs, joint faculty appointments, and establishment of field training centers for students in a number of official and voluntary federal, state, and local health and human services organizations.

For information concerning preparation and admission requirements and proposed curricula leading to degrees, see the catalog of the School of Public Health.

**DEPARTMENT OF BIOSTATISTICS (BIOS)**

BARRY H. MARGOLIN, Chair

**Professors**

Clarence E. Davis (27) Clinical Trials, Nonparametric Statistics, Cardiovascular Epidemiology
Ronald W. Helms (15) Statistical Computation, Linear Statistical Models, Longitudinal Designs and Analysis of Complicated Longitudinal Data
Alan F. Karr, Inference for Stochastic Processes, Image Analysis (Joint with Statistics)
Gary G. Koch (14) Categorical Data Analysis, Nonparametric Methods
Lawrence L. Kupper (19) Regression Analysis, Statistical Applications in Epidemiology and in Environmental Health
Barry H. Margolin (92) Statistical Methods for Genetic Toxicology and Environmental Health, Design and Analysis of Biometrical Experiments, Categorical Data Analysis
Dana Quade (6) Nonparametric Methods
Pranab K. Sen (10) Statistical Inference, Clinical Trials, Multivariate Analysis (Joint with Statistics)
Richard H. Shachman (18) Stochastic Models, Decision Analysis, and Their Health Applications; Health Services Research; Health Promotion/Disease Prevention
Chirayath M. Suchindran (29) Statistical Demography
Michael J. Symons (17) Consulting, Bayesian Applications, Statistical Education

**Associate Professors**

William D. Kahsbeek (55) Sample Design, Survey Analysis, Nonsampling Errors
Keith E. Muller (76) Linear and Nonlinear Repeated Measures Models, Study Design
Kinh N. Truong, Time Series Analysis, Nonparametric Regression, Bootstrap Methods, Hazard Regression, Splines
Craig D. Turnbull (26) Public Health Statistics, Research on Perinatal Outcomes and Behavioral Sciences

**Assistant Professors**

Jianwen Cai, Survival Analysis and Regression Models, Clinical Trials, Analysis of Correlated Responses
Lloyd J. Edwards, Measurement Error Models, Longitudinal Data Analysis, Statistical Inference
Bahajat Qaqish, Generalized Linear Models, Survival Analysis, Computing
Frandoise Seiller-Moiseiwitsch (91) Predictive Inference, Analysis of Molecular Genetic Data, Empirical Bayes Methodology

**Research Professors**

Richard E. Bilhborough (30) Economic Demography, Demography Economic Development, Environment
Lloyd E. Chambless (82) Epidemiological Applications, Analysis of Survey Data, Measurement Error
John G. Fryer, Statistical Oncology, Survival Analysis, Applications of Statistics in Rheumatology, Pediatrics, and Gynecology

**Research Associate Professors**

Shrikant J. Bangdiwala (80) Nonparametric Methods, Clinical Trials Methodology, International Health, Injury Prevention
James D. Huizing (79) Data Management, Multivariate Techniques, Clinical Trials
Michael J. Schell, Monotonic Regression Analysis, Order Restricted Inference, Clinical Trials, Low-Dose Extrapolation

**Research Assistant Professors**

Paul W. Stewart (84) Linear Models, Distribution Theory, Statistical Inference, Longitudinal Data
S. Neal Thomas, Observational Studies, Missing Data Methods, Multivariate Matching

**Adjunct Professors**

Harry A. Guess, Applications of Statistics to Medicine, Epidemiology, and Health Services Research
Daniel G. Horvitz, Sample Survey Design, Nonsampling Errors in Surveys
Norman L. Kaplan, Stochastic Processes, Statistical Genetics
Judith T. Lessler, Sampling
Anders S. Lunde, Demography, Vital Statistics, Health Statistics, Social Statistics
W. Kenneth Poole, Clinical Trials, Statistical Research Administration
Christopher Portier, Design and Analysis of Animal Cancer Bioassay Studies
Donald W. Reinert, Design, Applications in Highway Safety and Injury Prevention
Ibrahim A. Salama (38) Nonparametric Statistics, Order Statistics, Ergodic Theory
Bababui V. Shah (49) Survey Data Analysis Software, Multivariate Data Analysis, and Quality Assurance
Clarice R. Weinberg, Statistical Methods in Epidemiology; Reproductive Epidemiology

**Adjunct Associate Professors**

John P. Creason, Statistical Application in Environmental Health, Dose-Response Methodology
Edward L. Frome, Statistical Computing and Biomedical Data Analysis
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Sandra B. Greene, Health Services Applications
Frank E. Harrell Jr. (69) Nonparametric Statistics, Survival Analysis, Clinical Studies
Grace E. Kissling, Statistical Consulting, Empirical Bayes Estimation and Logistic Regression
Lisa M. LaVange, Sampling Design, Longitudinal Data Analysis
Kerry L. Lee (52) Multivariate Analysis, Clinical Trials, Regression Modeling Strategies for Survival and Risk Analysis
Timothy M. Morgan, Clinical Trials, Survival Analysis, Cancer Statistical Methods
Walter Piezorsch, Study of Synergism, Analysis of Genetics, Toxicity Assays and the Construction and Assessment of Confidence Bands in Various Settings
Steven M. Snapinn, Statistics in the Pharmaceutical Industry
Takashi Yanagawa, Nonparametric Methods, Robustness and Categorical Data Analysis

Adjunct Assistant Professors
Ingrid A. Amara, Categorical Data Statistics in Psychiatry
Delton Arkinson, Public Health Statistics
J. Michael Bowling, Survey Methodology, Evaluation, Injury Prevention
Kerrie E. Boyle, Demographic Models, Survey Statistics
Sonia M. Davis, Bioequivalence, Statistics in the Pharmaceutical Industry
Elizabeth R. DeLong, Clinical Trials, Case Control Studies and Evaluation of Diagnostic Tests
Ralph 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
Imogene McCanless, Statistics in the Pharmaceutical Industry
Claire Sherman, Carcinogenic Models, Environmental Biostatistics
Marjolein V. Smith, Biometrics
Darlene K. Stangl, Bayesian Statistics, Survival Analysis
Maura E. Stokes, Categorical Data Analysis
Russell D. Wolfinger, Statistical Computation

Professors Emeriti
James R. Abernathy
Elizabeth J. Coder
Regina C. Elandid-Johnson
James E. Grizzle
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.

106 MATHEMATICAL METHODS IN BIOSTATISTICS (1). Prerequisite, Mathematics 32. Calculus and special mathematical techniques necessary for biostatistics. Summer. Staff.

107 MATRIX THEORY IN BIOSTATISTICS (1). Prerequisite, Mathematics 32. Review of matrix theory results useful in statistics. Summer. Staff.

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. Turnbull, Staff.

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. 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.

135 PROBABILITY AND STATISTICS (4). Prerequisite, Mathematics 32 or equivalent. Elements of descriptive statistics. Basics of probability; random variables and their probability distributions; special distributions, including the binomial, Poisson, normal, gamma; expectation and moments; linear combinations of random variables. Elements of estimation and hypothesis testing; analysis of variance; multiple regression; analysis of categorical data; some nonparametric methods. Particular attention is given to the statistical treatment of environmental science and engineering problems. Fall. Symons.

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.

145 PRINCIPLES OF EXPERIMENTAL ANALYSIS (3). Prerequisites, Biostatistics 110 or 135 or equivalent and 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 ELEMENTS OF PROBABILITY AND STATISTICAL INFERENCE (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. Shachetman.

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. Kupper.

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 INTRODUCTORY APPLIED STATISTICS (3). Prerequisites, Biostatistics 111, 150, or equivalents. Approaches to problems of description, goodness of fit, univariate location and scale, bivariate independence and correlation, and comparison of independent or matched samples, involving categorical, discrete, normal, or ranked data. Spring. Quade.
163 INTERMEDIATE LINEAR MODELS (3). Prerequisites, Biostatistics 107 or Mathematics 147, Biostatistics 111, 145, 150, or equivalents. Regression analysis in matrix terms, general linear hypothesis, diagnostics, model building. One- and two-way ANOVA with fixed or random effects. Power algorithms, analysis of covariance. Fall. Muller.

164 SAMPLE SURVEY METHODOLOGY (Statistics 104) (3). Prerequisite, Biostatistics 150 or equivalent or permission of the instructor. Fundamental principles and methods associated with survey sampling, with primary attention given to nonmathematical 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.

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 160) (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. Spring. Muller.

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. Fall and spring. Sen.

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. Davis.

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, Bibilorrow.

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. Staff.

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. Spring and summer. Hoising.

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. Fall, spring, and summer. Hoising.

231 BAYESIAN STATISTICS (3). Prerequisite, Biostatistics 161 or equivalent. Bayesian perspective on statistical theory (foundations and inference); decision theory; applications of prior to posterior analysis, predictive inference; estimation of distributions via numerical and stochastic simulation techniques; empirical Bayes methodology. Fall. Seiller-Moiseiwitsch.

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 (1-4). Prerequisites, Biostatistics 161, 163 or equivalents, 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. 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. Fall. Bangdiwala.

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.) Sen.

259 APPLIED TIME SERIES ANALYSIS (3). Prerequisites, Biostatistics 161 and 163 or equivalents, and permission of the instructor. Topics include correlogram, 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. Tranuong.

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. Sen.


263 ADVANCED LINEAR MODEL THEORY (3). Prerequisites, Biostatistics 161, 163, Mathematics 147, Mathematics 116 or 137. Multivariate normal and related distributions; theory of estimation and statistical inference for multivariate linear models. Spring. Stewart.

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, nonsampling errors, complex survey designs, employing auxiliary information, and other miscellaneous topics. Fall. (1995 and alternate years.) Kalbbeck.

265 LINEAR MODELS IN CATEGORICAL DATA ANALYSIS (3). Prerequisites, Biostatistics 161, 163, 165, and 166 or equivalents. Theory of statistical methods for analyzing categorical data by means of linear models; multifactor and multivariate situations; interpretation of interactions. Spring. Koch.

266 ADVANCED LINEAR MODELS I (4). Prerequisites, Biostatistics 161, 163, Mathematics 147, Mathematics 116 or 137. Theory and methods of linear statistical models for continuous response data, including overview of experimental design, review of ANOVA, multiple regression; multivariate distributions; multivariate normal distributions, distributions of univariate and multivariate quadratic forms; estimation, hypothesis test, and confidence region procedures for general linear univariate, multivariate, and mixed (random effects) models. Fall. Helms and Edwards.

267 ADVANCED LINEAR MODELS II (4). Prerequisite, Biostatistics 266. Theory and methods of linear statistical models for continuous response data, including definitions of parameters, hypotheses, isomorphisms, orthogonal polynomials, incomplete/informatively 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. Helms and Edwards.

271 DEMOGRAPHIC TECHNIQUES II (3). Prerequisites, Biostatistics 170 and integral calculus. Life table techniques; methods of analysis when data are deficient; population projection methods; interrelations among demographic variables; migration analysis; uses of population models. Spring. Suchindran.

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. (1995 and alternate years.) Suchindran.

280 THEORY AND METHODS FOR SURVIVAL ANALYSIS (3). Prerequisite, Biostatistics 180 or permission of the instructor. Continuation of Biostatistics 180 with detailed discussion of semiparametric likelihoods, time-dependent covariates, robustness and tests of assumptions, covariate adjustment, and multivariate analysis. Fall. Staff.

281 STATISTICAL METHODS IN HUMAN GENETICS (GNET 281) (3). Prerequisite, Biostatistics 161 or 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 software packages), and analysis of molecular genetic data. Spring. (1995 and alternate years.) Staff.

341 PRINCIPLES OF STATISTICAL CONSULTING (1). Prerequisites, 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. Fall and spring. Symons.

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 problems, to provide appropriate technical assistance, and to communicate statistical results. Fall, spring, and summer. Staff.

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 (1-3). Fall, spring, and summer. Staff.

393 MASTER'S THESIS (0-6). Fall, spring, and summer. Staff.

394 DOCTORAL DISSERTATION (0-9). Fall, spring, and summer. Staff.

400 GENERAL REGISTRATION (0).

DEPARTMENT OF ENVIRONMENTAL SCIENCES AND ENGINEERING (ENVR)

WILLIAM H. GLAZE, Chair

Professors
Richard N. L. Andrews (50) Environmental Policy
John M. Bane Jr., Marine Sciences
Douglas J. Crawford-Brown (54) Health Physics, Medical Physics, Theoretical Radiobiology
Francis A. DiGiano (51) Water and Wastewater Treatment Processes, Mathematical Modeling of Mass Transport
Donald L. Fox (8) Atmospheric Chemistry, Aerosols
William H. Glaze (72) Measurement of Organic Compounds in Environmental Samples, Formation of By-Products in Water Disinfection Practices, Ozone Chemistry in the Aqueous Phase, Treatment Methods for the Removal of Trace Organic Compounds from Water
Avram Gold (43) Environmental Toxicology
Milton Sydney Heath Jr. (39) Natural Resource Law
Harvey Edward Jeffries (14) Atmospheric Chemistry, Modeling and Computerized Data Acquisition
R. Eugene Johnston (28) Electronic Displays for Medical Imaging; Studies in Human Visual Perception
Richard M. Kamens (55) Mutagenic and Chemical Changes of Combustion Particles in the Atmosphere
Donald T. Laura (18) Water and Wastewater Systems Analysis, Mathematical Modeling
David Leith (56) Air Pollution Control Engineering, Aerosol Technology
Christopher S. Mattern, Marine Sciences
David H. Moreau (48) Water Resources Planning
Hans W. Pearl (65) Environmental Microbial Ecology
Frederic K. Pfander (25) Environmental Microbiology
Stephen M. Rappaport (76) Exposure Assessment; Industrial Hygiene
Parker Cramer Reit (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
Dale Whittington (70) Water Resources Economics, International Development

**Associate Professors**
Michael D. Antken (66) Wastewater and Hazardous Waste Treatment, Applied Biotechnology
Louise M. Bell (62) Metabolism, Toxicology and Genotoxicity of Xenobiotics
George Christakos (79) Applied Mathematics in Water Resources Engineering, Stochastic Modeling
Michael Flynn (61) Relationship Between Exposure and the Capture Efficiency of Local Exhaust Hoods, Computer-Aided Optimization of Ventilation Systems
Richard A. Luetich, Marine Sciences, Physics of Shallow Water Bodies
Donald G. Willhoit (36) Radiological Hygiene and Occupational Health

**Assistant Professors**
Scott T. Martin, Aquatic and Atmospheric Chemistry
Leena Nylander-French, Environmental Health Sciences
Lori A. Todd (75) Application of Computer Tomography and Optical Remote Sensing for Sampling and Evaluating Gases in Work Place Air
Steven C. Whalen, Ecology, Limnology

**Lecturer**
Donald E. Francisco (9) Limnology and Aquatic Microbial Ecology
Research Associate Professor
Frances Lynn (67) Environmental Risk Assessment, Communication of Scientific and Technological Information, Sociology of Science

**Research Assistant Professors**
Dionissios Hristopoulou, Stochastic Modeling, Multiphase Flow and Transport
Stephen R. McDowell (87) Atmospheric Chemistry
Ramiah Sangaiah (90) Chemical Synthesis
Y. S. Carol Shieh (88) Environmental Virology

**Adjunct Professors**
Linda S. Birnbaum (86) Xenotoxic Metabolism, Biochemical Toxicology
Merrill Eitenbud, Environmental Radioactivity
David S. Ensor (80) Aerosol Science
J. Ronald Haas (64) Environmental Chemistry
Paul W. Prendiville, Water and Wastewater Treatment Plant Design
Barbara Walton, Ecototoxicology, Bioremediation, Biomonitoring
William E. Wilson Jr., Aerosols, Photochemistry, Smog Chambers

**Adjunct Associate Professors**
Philip W. Albro (38) Environmental Chemistry
Michael A. Berry, Program and Research Management, Environmental Legislation, Health Assessments, Indoor Air Pollution
Larry D. Claxton, Mutagenes in Testing, Biochemical Chemistry

David DeMarini (81) Genetic Toxicology
John M. Dement (60) Industrial Hygiene
Philip Hamrick, Radiological Hygiene
John L. S. Hickey (45) Industrial Hygiene Engineering, Industrial Ventilation
Linda W. Little, Bioassay Procedures
Joseph Pinto (82) Atmospheric Modeling
Donald Tyn dall, Radiation Biology

**Adjunct Assistant Professors**
Deborah Amanal, Risk Analysis
Galen R. Brubaker, Bioremediation
Joel Leutze, Genetic Bioassays
Michael Madden, Choline Reactions with Biomolecules
Dennis F. Naugle (84) Environmental Management
Daniel L. Norwood, Environmental Analytical Chemistry, Mass Spectrometry
Andrew Perkash, Water and Wastewater Treatment Plant Design
Jane Ellen Simmons (91) Hepatic and Renal Toxicology
Thomas B. Starr, Risk Assessment
Woodhall Stopford, Occupational Medicine Physics
David B. Washburn, Diagnostic Radiology
Russell W. Wiener (83) Indoor Air Quality, Aerosol Monitoring

**Adjunct Lecturer**
Bobby M. Wilson, Health Physics, Radiological Hygiene, Environmental Radiation, Emergency Response and Program Management

**Professors Emeriti**
Emil Theodore Chanlett
Robert L. Harris
J. Donald Johnson Jr.
Edward J. Kuenzler
Daniel Alexander Okun
Morris A. Shiffman
Mark S. Shuman
Charles Manuel Weiss

**Courses**

100 READING IN ENVIRONMENTAL SCIENCES AND ENGINEERING (1-6). Prerequisite, permission required for students outside the department. Extensive library 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.

101 ENVIRONMENTAL HEALTH (2). Survey course: relationship between environmental quality, human health and welfare. Contamination in human environments; physical, biological, and social factors; trade-offs regarding prevention and remediation measures. Lectures, group discussions, and projects. Emphasizes critical thinking. Satisfies core SPH requirement. Two credit hours per week. Fall, spring. Staff.

102 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.
119 MARINE BIOGEOCHEMISTRY (Marine Sciences 119) (3). Prerequisites, one year biology plus organic and/or physical chemistry or one of MASC 101, GEOL 164, or ENVR 122. 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. Intended for science majors who have completed at least one year of biology plus organic and for physical chemistry or MASC 101, or GEOL 164, or ENVR 122. In all other cases, permission of the instructor is required. (Note: Advanced graduate students should consider MASC 140.) Fall. (Alternate years.) Amos.  

122 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.  

122L AQUATIC CHEMISTRY LABORATORY (1). Corequisite, Environmental Sciences and Engineering 122. Wet chemical and computational laboratory exercises illustrating principles and applications of chemical equilibria in natural waters. Two laboratory hours per week. Fall. Singer.  

123 ENVIRONMENTAL ORGANIC CHEMISTRY (3). Prerequisite, Physical Chemistry. This course addresses the partitioning, exchange, and chemical transformations of organic contaminants in the water, air, and soil environments. Fall. Kamens, Christian.  

124 ENVIRONMENTAL ANALYTICAL CHEMISTRY (3). Sampling, sample treatment, data evaluation electrochemical, spectrophotometric, and mass spectral techniques for students with no analytical chemistry background. Three lecture hours per week. Spring. Staff.  

127 OCEANOGRAPHY (3). (Biology 126, Marine Sciences 101, Geology 101). Prerequisites, Biology 11, Chemistry 21, Physics 25, or permission. An interdisciplinary study of the sea and the interrelationships of marine processes. Three lecture hours a week. Fall and spring. Neumann, Frankenberg.  

128 CHEMICAL OCEANOGRAPHY (Marine Sciences 105) (4). Prerequisite, one semester of Physical Chemistry or Environmental Sciences 122, or Chemistry 180 or equivalent. Consideration of the variation and abundance of sea water constituents and the chemical, physical, and biological processes contributing to their distribution, as well as problems of dispersion of conservative and nonconservative substances. Spring. Martin.  


131 WATER AND WASTEWATER TREATMENT PROCESSES (2). Prerequisite, permission of the instructor. Principles of the typical processes and operation of domestic water and wastewater treatment systems. Not open to MSESE students. Two lecture hours per week. Spring and summer. Francisco.  

132 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.  

132L LIMNOLOGY LAB (2). Prerequisite or corequisite, ENVR 132, or permission of instructor. Demonstration and application of limnological field and laboratory techniques. Could involve one full day per week in the lab or field. Travel provided. Four laboratory hours per week, fall. Whalen.  

133 SOURCES, TRANSPORT, AND FATE OF ENVIRONMENTALLY IMPORTANT MATERIALS (3). Prerequisites, one year of college chemistry, and one semester each of college physics, calculus, and biology or permission of the instructor. Multimedia processes important in environmental compartments. Development of predictive abilities for spatial and temporal alterations and movements of materials. Three lecture hours a week. Spring. Christiansen, Jeffries, Pierson.  

134 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 man. Two lecture and three laboratory hours a week. Spring. Pierson.  

135 BIOLOGY IN ENVIRONMENTAL SCIENCE (4). Prerequisite, general chemistry. An introduction to biology, including principles of biochemistry, cell structure, classification, and ecology. Laboratory emphasizes techniques utilized in measurement and control of environmental pollution. Three lecture and two laboratory hours per week. Fall. Francisco.  

136 BIOLOGICAL OCEANOGRAPHY (Biology 140, Marine Sciences 104) (4). Prerequisite, Biology 54 or Biology 105. Physical, chemical, and biological factors characterizing estuarine and marine environments, with emphasis on factors controlling animal and plant populations; course includes methods of analysis, sampling, and identification. Five lectures and five laboratory hours a week. Summer. Staff.  

137 ECOLOGY OF WETLANDS (Marine Sciences 137) (4). Prerequisite, 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.  

141 AIR AND INDUSTRIAL HYGIENE (3). Problem definition, sources of information, health effects, legislative framework, and control methods for physical, chemical, and biological hazards. Recognition, evaluation, and remediation of hazards associated with community and industrial environments. Three lecture hours per week. Fall. Fox, Todd.  

144 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.  

145 INTRODUCTION TO AEROSOL SCIENCE (4). Prerequisite, 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. Reist.  

145L AEROSOL SCIENCE LABORATORY (2). Prerequisite or corequisite, Environmental Sciences 145. Basic laboratory exercises in aerosol sciences. Fall. Reist.  

147 OCCUPATIONAL SAFETY AND ERGONOMICS (3). (Public Health Nursing 286) 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.  

149 HEALTH HAZARDS OF INDUSTRIAL OPERATION (3). Prerequisite, Environmental Sciences 141. An introduction to the health hazards associated with the various unit operations of industry. Field trips to local industries planned. Spring. Flynn.
153 ENVIRONMENTAL MANAGEMENT AND POLICY (3). (City and Regional Planning 153, Public Policy Analysis 153). Prerequisite, Environmental Sciences and Engineering 51 or graduate standing. 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.

154 ENVIRONMENTAL MANAGEMENT AND POLICY CORE SEMINAR (1). Prerequisite, graduate standing in major, permission of the instructor. Core seminar in environmental management and policy; preparation of issue papers, discussion of current applications and professional practice. Two seminar hours per week. Andrews.

158 MATHEMATICAL METHODS OF ENVIRONMENTAL MODELING (3). Prerequisite, calculus. Mathematical basis of environmental models is reviewed, including an overview of axiomatic systems, differential equations, transforms, parameter estimation, and numerical simulations. Fall. Crawford-Brown.

159 ANALYTIC THOUGHT AND ENVIRONMENTAL RISK (3). Prerequisite, permission of the instructor. The principles of logical analysis are developed and applied to environmental problems. Concepts such as evidence, inference, and proof are formalized for calculations of environmental risk. Two lecture and one seminar hours per week. Spring. Crawford-Brown.


164 FIELD OBSERVATIONS IN RADIOLICAL HYGIENE (2). Prerequisite, permission of the instructor. Field observation of health physics practices at nuclear fuel cycle facilities and government nuclear facilities. Field fee $200. Spring. (1996 and alternate years.) Watson.


168 COMPREHENSIVE RADIATION BIOLOGY (3). (Oral Diagnosis 190). Prerequisites, Biology 11, introductory physics. A survey of the biological effects of ionizing and nonionizing radiations ranging from the molecular to the ecosystem level. Related topics such as the effects of nuclear war and radiation hormesis are also included. Three lecture hours per week. Spring. Tyndall.

171 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.

176 INTRODUCTION TO GROUNDWATER ENGINEERING (3). Prerequisites, math through differential equations and some familiarity with fluid mechanics. This course covers the governing equations and analytical solutions for groundwater flow, contaminant transport in the aqueous phase, and water movement in the unsaturated zone. Three lecture hours per week. Fall. Miller.

176L SUBSURFACE PROCESS LABORATORY (2). Corequisite, Environmental Sciences and Engineering 176. Experimental and numerical modeling laboratory to investigate fluid flow and species transport in multiphase systems. Three laboratory hours per week. Fall. Miller.

190 READING IN ENVIRONMENTAL HEALTH SCIENCES (1-6). Prerequisite, permission of the instructor. Extensive library study of a specific subject in Environmental Health Sciences. One to six seminar hours per week. Fall, spring, summer. EHS staff.

191 HEALTH AND ECOLOGICAL 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. EHS staff.

192 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 end-points, emphasizing adverse effects of environmental agents, using laboratory and field techniques. Two laboratory hours per week. Fall. Ball and Sobsey.

193 BIOCHEMICAL TOXICOLOGY (3) (Biochemistry 142, Toxicology 142). Prerequisites, Chemistry 130 plus one course in biochemistry; permission of the instructor if prerequisites not met. Biochemical actions of toxicants, and assessment of cellular damage by biochemical measurements. Three lecture hours per week. Spring. Holbrook.

195 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, 1995 and alternate years. Sobsey.


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. Two or more hours a week. Fall, spring, summer. Staff.

210 ENVIRONMENTAL POLICY SEMINAR (1). Current issues in environmental policy research and practice, presented by faculty, advanced students, and guest speakers. Two seminar hours per week. Fall and spring. EMP staff.

217 SYSTEMS ANALYSIS IN ENVIRONMENTAL PLANNING (3). Prerequisite, calculus. Applications of systems analysis techniques to the management of environmental quality. Spring. Lauria.

219 WATER POLICY IN LESSER DEVELOPED COUNTRIES (3). (City and Regional Planning 219). 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 voting; 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.

222 SPECIAL TOPICS IN ENVIRONMENTAL CHEMISTRY (1-3). Prerequisite, permission of the instructor. Current topics in aquatic and atmospheric chemistry. One to three lecture hours per week. Fall, spring. Staff.
225 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. Hasu, Albano.

232 SPECIAL TOPICS IN ENVIRONMENTAL BIOLOGY (1-3). Prerequisite, permission of the instructor. Current topics in aquatic biology and ecology. One to three lecture hours per week. Fall. Spring. Staff.

238 MICROBIAL DEGRADATION OF XENOBIOTICS (3). Prerequisites, Environmental Sciences and Engineering 122 and 131 or 134 or an undergraduate course in microbiology. Presents and unifies emerging bodies of knowledge in microbial ecology, physiology, and genetics and integrates them into discussions of chemical degradation in natural and engineered systems. Three lecture hours per week. Fall of even-numbered years. Aitken and Phander.

241 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.

241D VENTILATION DESIGN PROBLEM (1). Corequisite, Environmental Sciences and Engineering 241; prerequisite, permission of the instructor. Design problem for industrial operation. One seminar hour per week. Fall. Flynn.

242 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.

244 ENVIRONMENTAL MEASUREMENTS LABORATORY (3). Physical and chemical techniques for measuring toxic gases in the environment. Practical experiments illustrate techniques applicable to ambient air monitoring, indoor air pollution, or the industrial hygiene survey. One lecture and four laboratory hours per week. Spring. Reist.

245 AIR POLLUTION CONTROL (3). Prerequisite, Environmental Sciences 141. Engineering control of air pollution control systems and discussion of air pollution regulation and standards. Spring. Staff.

246 ADVANCED METHODS OF EXPOSURE ASSESSMENT (3). Prerequisites, Biostatistics 135, 145 (145 may be taken concurrently), Environmental Sciences and Engineering 191 or equivalent, and permission of the instructor required for nonmajors. Covers the statistical and biological considerations in assessing environmental exposures to chemicals with particular attention to airborne chemicals in occupational settings. Spring of even-numbered years. Rappaport.

247 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.

252 ENVIRONMENTAL RISK ASSESSMENT (3). Prerequisite, permission of the instructor. The characterization of population exposures and the evidence used to identify environmental substances that may pose a human health risk. The theory and methods for quantitatively estimating risk. Spring. Staff.


255 MANAGEMENT OF HAZARDOUS WASTE (3). Prerequisite, Chemistry 61 or equivalent. The classification, chemistry, and toxicology of hazardous wastes are presented. Control technologies, regulatory policies, and management strategies are examined. Fall. Staff.

257 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. EMP staff.

258 ANALYSIS FOR RISK MANAGEMENT (Political Science 208) (3). Quantitative techniques for the analysis of environmental decisions, including application of modeling and sensitivity analysis, probability, value of information. The course also explores risk attitudes and conflicting objectives. Three lecture hours per week. Fall. EMP staff.

263 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. Watson.

264 RADIATION HAZARDS EVALUATION II (3). Prerequisite, Environmental Sciences and Engineering 263. Internal and external hazards of ionizing radiation are evaluated. Problems in hazards evaluation and protection of the types included in certification exams of the American Board of Health Physics are studied. Three lecture hours per week. Fall. Watson.

272 DESIGN OF WATER SYSTEMS (3). Prerequisite, permission of the instructor required for non-engineering students. Use of mathematical models and computer programs for designing water systems, including pumping stations, reservoirs, water distribution, and wastewater collection networks. Spring. Lauria.

273 WATER AND WASTEWATER TREATMENT PLANT DESIGN (3). Prerequisites, Environmental Sciences and Engineering 274 and 275. 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.

274 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.

275 BIOLOGICAL TREATMENT PROCESSES (2). Prerequisite, Environmental Sciences and Engineering 171 or equivalent. Theory and practice of biological processes used for conventional and advanced treatment of wastewater. Two lecture hours per week. Spring. Aitken.

276 INDUSTRIAL WASTE TREATMENT (3). Prerequisites, Environmental Sciences and Engineering 122, 274, permission of the instructor. Principles and practice of removing pollutants from industrial wastes by physical, chemical, biological, and thermal processes. Students visit industrial facilities and prepare oral and written reports on waste generation and management. Three lecture hours per week. Fall of odd-numbered years. Aitken.

277 TREATMENT PROCESS LABORATORY (2). Corequisite, Environmental Sciences and Engineering 274 or 275. Demonstration of physical, chemical, and biological principles and their application to water and wastewater treatment through bench- and pilot-scale laboratory exercises. Four laboratory hours per week. Spring. Singer, DiGiano.


280 MULTIPHASE TRANSPORT PHENOMENA (3). Prerequisites, Environmental Sciences and Engineering 176 or 171 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.


282 PUBLIC INVESTMENT THEORY AND TECHNIQUES (City and Regional Planning 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. Whittington.

283 NATURAL RESOURCE LAW AND POLICY (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.

284 WATER RESOURCES PLANNING AND POLICY ANALYSIS (Planning 234) (3). Prerequisite, permission of the instructor. Introduction to water resources planning and management. Emphasis on federal and state water resources policies and the development of analytical skills for identification of environmental problems associated with urban water resources development. Spring. Moreau.

286 ENVIRONMENTAL QUALITY PLANNING (Planning 236) (3). Covers methods for planning and analysis of regional environmental systems with a focus on management of flows of mass in regional settings that affect the quality of the environment. Three lecture hours per week. Spring. Moreau.

290 HEALTH EFFECTS OF OUTDOOR AND INDOOR AIR POLLUTION (3). To assess 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. Hauck, Rappaport.

291 PRINCIPLES OF CHEMICAL CARCINOGENESIS (2). Prerequisite, Environmental Sciences and Engineering 190 or equivalent. 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.

292 MOLECULAR APPROACHES TO ENVIRONMENTAL TOXICOLOGY (3). Prerequisites, Environmental Sciences and Engineering 190 or equivalent or permission of the instructor. Recent advances in molecular biology applied to elucidation of problems in environmental toxicology with illustrations from the current literature. Three lecture hours per week. Spring. Ball.

293 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 toxicology, developmental toxicology, and radiation toxicology. Three lecture hours per week. Fall. Swenborg.

294 BIOTRANSFORMATION OF XENOBIOTICS (Pharmacology 209) (2). Prerequisite, Chemistry 130, Pharmacology 202, or permission of the instructor. Recent advances in the mechanisms by which drugs and other foreign chemicals are metabolized to active and/or inactive products. The importance of metabolic pathways to therapy/toxicity. Two lecture hours per week. Fall. Harper.

295 ENVIRONMENTAL VIROLOGY (4). Prerequisite, introductory course in microbiology or permission of the instructor. Ecological, environmental health, and fundamental aspects of virology, with special emphasis on viruses in water, food, and air. Three lecture and two laboratory hours per week. Spring. 1996 and alternate years. Soskey.

301 SEMINAR IN ENVIRONMENTAL SCIENCES AND ENGINEERING (1 or more). No prerequisites. 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.

320 RESEARCH IN ENVIRONMENTAL CHEMISTRY (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. Fall, spring, summer. Staff.

321 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.

324 CHEMISTRY OF HUMIC SUBSTANCES (1). Prerequisite, Environmental Sciences and Engineering 133. 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.

330 RESEARCH IN ENVIRONMENTAL BIOLOGY (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. Fall, spring, summer. Staff.

333 SEMINAR IN AQUATIC AND ATMOSPHERIC SCIENCES (1-3). Prerequisite, Environmental Sciences and Engineering 135. Advanced topics seminar in aquatic and atmospheric sciences. One to three seminar hours per week. Fall, spring. Staff.

334 ENVIRONMENTAL MICROBIOLOGY METHODS (1). Prerequisite, general microbiology or Environmental Sciences and Engineering 134. Microbiological analytical methods that can be used in the environmental setting. Methods for assessing numbers, biomass, metabolic activity, and genetics. One lecture hour per week, on request. Pfaender.

340 RESEARCH IN AIR AND INDUSTRIAL HYGIENE (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. Fall, spring, summer. Flynn, Gold, Fox, Fraser, Jeffries, Leith, Reist, Todd.

341 ENGINEERING RESEARCH IN AIR AND INDUSTRIAL HYGIENE (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. Engineering research problems relating to air and industrial hygiene topics such as control equipment design, industrial ventilation parameters. Fall, spring, summer. Flynn, Fox, Jeffries, Leith, Reist, Todd.
345 SELECTED TOPICS IN AEROSOL SCIENCE (3).
Prerequisite, Environmental Sciences and Engineering 145. A detailed study of the most recent developments in selected areas of aerosol science. Topics could cover such areas as impaction, size-selective sampling, particle deposition, cloud formation, atmospheric cleansing of aerosols, visibility, and visual range, application of fractal geometry to aerosol science, or other timely material. Three lecture hours per week. Spring, Staff.

350 RESEARCH IN ENVIRONMENTAL MANAGEMENT AND PROTECTION (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. Fall, spring, summer. Andrews, Christman, Gold, Lynn.

353 Ph.D. SEMINAR IN ENVIRONMENTAL MANAGEMENT AND POLICY (City and Regional Planning 353, Public Policy Analysis 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. Staff.

360 RESEARCH IN RADIOLOGICAL HYGIENE (1-9).
Prerequisite, consultation with the faculty and approval of subject and proposed program. Fall, spring, summer. Crawford-Brown, Watson, Willhoit.

361 ATMOSPHERIC SOLAR RADIATION (1).
Prerequisite, Environmental Sciences and Engineering 133. Solar radiation transfer, surface irradiance, and active flux. Atmospheric photolysis rates of chemical species. Broadband and spectral solar radiation measurements, and simple numerical models of radiation transfer. One lecture hour per week. Spring, Jefries.

362 URBAN AND REGIONAL ATMOSPHERIC CHEMISTRY (2).
Explicit atmospheric chemistry of volatile organic carbon, oxides of nitrogen, and oxides of sulfur. Formulation and testing of condensed photochemical reaction mechanisms for use in air quality models. Two lecture hours per week. Fall. Jefries.

363 GLOBAL ATMOSPHERIC CHEMISTRY (1).
Prerequisite, Environmental Sciences and Engineering 362. Photochemical processes in the global atmosphere. One lecture hour per week. Fall. Jefries.

364 MEASUREMENT OF OZONE AND OXIDES OF NITROGEN IN AIR (1).
Prerequisite, Environmental Sciences and Engineering 141. Calibration and measurement of ozone and oxides of nitrogen using research instruments. One laboratory hour per week. Fall. Jefries.

365 MEASUREMENTS OF VOLATILE ORGANIC COMPOUNDS IN AIR (1).
Prerequisite, Environmental Sciences and Engineering 141. Calibration and measurement of volatile organic compounds using research instruments. One laboratory hour per week, on request. Jefries.

366 MEASUREMENT OF GAS-PARTICLE INTERACTIONS (1-3).
Prerequisite, Environmental Sciences and Engineering 141 or physical chemistry. Organic and inorganic reactions of gas and particle interactions; polycyclic aromatic hydrocarbons on soot particles; acid aerosols; laboratory projects using chambers and associated instrumentation. One lecture and one laboratory hour per week, on request. Kamens.

367 DEVELOPMENT OF ATMOSPHERIC CHEMISTRY MODELS (1).
Formulation of computer codes for simulating atmospheric chemistry. One lecture hour per week, on request. Jefries.

368 OPERATION OF URBAN AIRSHED MODELS (1).
Prerequisite, Environmental Sciences and Engineering, 367. Application of an urban-scale three-dimensional transport and chemical reaction model to photochemical oxidant problems. One lecture hour per week, on request. Jefries.

369 AIR POLLUTION REGULATORY POLICY ISSUES (1).
Prerequisites, Environmental Sciences and Engineering, 362. Role of atmospheric science in the formulation of the Clean Air Act and EPA oxidant regulatory policies. One lecture hour per week, on request. Fox, Jefries.

370 INVESTIGATIONS IN WATER RESOURCES ENGINEERING (1-9).
Prerequisites, consultation with the faculty and approval of subject and proposed program. Fall, spring, summer. Aitken, Christakos, DiGiano, Hristopulos, Lauria, Miller, Singer.

390 RESEARCH IN ENVIRONMENTAL HEALTH SCIENCES (1-9).
Prerequisite, consultation with the faculty and approval of subject and proposal program. May be repeated. Hours and credits to be arranged. One to nine laboratory hours per week. Fall, spring, summer. EHS staff.

391 SEMINAR IN ENVIRONMENTAL HEALTH SCIENCES (1).
Prerequisite, permission of the instructor for students outside program area. Discussions and surveys on current critical issues in environmental health science. On request. EHS staff.

392 MASTER'S TECHNICAL REPORT (0-9).
The technical report requirement for MSPH, MPH, and MSME candidates is satisfied by the extensive study of a problem in environmental sciences and engineering. Fall, spring, and summer. Staff.

393 MASTER'S THESIS (0-9).
Fall, spring, and summer. Staff.

394 DOCTORAL DISSERTATION (0-9).
Fall, spring, and summer. Staff.

400 GENERAL REGISTRATION (0).

DEPARTMENT OF EPIDEMIOLOGY (EPID)

DAVID A. SAVITZ, Chair

Professors
Gerardo Heiss (41) Cardiovascular Epidemiology
Barbara S. Hulka (05) Cancer Epidemiology, Biochemical Epidemiology, Health Services Research
Michel A. Ibrahim (06) Health Services Research and Health Policy, Cardiovascular Epidemiology, Cancer Epidemiology, Case-Control Studies
Berton H. Kaplan (08) Social Epidemiology
Lenore Kohlmeier (165) Nutritional 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. Tyrler (13) Cardiovascular Epidemiology

Associate Professors
Ralph S. Bunic (142) Public Health Virology, Molecular Virology
James E. Hall (143) Host-Parasite Metabolism, Biological Chemistry
Irv Hertz-Piccotto (137) Environmental Epidemiology, Reproductive Epidemiology
Dana P. Loomis (130) Occupational Epidemiology, Environmental Epidemiology
Beth M. Newman (139) Cancer Epidemiology, Genetics
Andrew F. Olshan (147) Reproductive Epidemiology
Charles L. Poole (193) Methodology
Victor J. Schoenbach (64) Behavioral Epidemiology, Infectious Diseases Epidemiology (Primarily STDs), Cancer Control (Primarily Smoking Cessation)
Lola V. Stamm (145) Public Health Bacteriology, Molecular Cloning, Pathogenesis of Infectious Disease
H. June Stevens (172) Nutritional Epidemiology
James C. Thomas (127) Infectious Disease Epidemiology
David J. Weber (96) Infectious Disease Epidemiology
Kristen Ann Weigle (112) Infectious Diseases
Steven B. Wing (99) Cardiovascular Epidemiology, Occupational/Environmental Epidemiology
Assistant Professors
Robert C. Millikan (166) Cancer Epidemiology
Christine L. Moe (174) Infectious Disease Epidemiology
Wayne D. Rosamond (162) Cardiovascular Epidemiology
Rachel A. Royle (161) Infectious Disease Epidemiology

Research Assistant Professors
Kathleen Conway, Cancer Epidemiology
Lori Carter-Edwards (192) Cardiovascular Epidemiology
Duanping Liao (189) Cardiovascular Epidemiology

Clinical Professors
Timothy S. Carey (138) Clinical Epidemiology
Gordon H. DeFries (54) Health Services Research
Jo-David Fine (179) Epidemiology of Skin Diseases
Curtis G. Hames (44) Clinical Epidemiology
Abraham G. Hartzema, Pharmacoeconomics
Ronald Hunt (164) Oral Epidemiology
G. Joseph Norwood, Pharmacoeconomics
David F. Ransohoff (160) Health Care Epidemiology
Robert S. Sandler (73) Cancer Epidemiology
Philip D. Sloane (131) Aging
Ronald P. Straus (182) Oral Epidemiology
Edward H. Wagner (15) Clinical Epidemiology, Health Services Research

Clinical Associate Professors
Brian A. Boehlecke (84) Occupational Medicine
Joanne M. Garrett (156) Health Services Research
Peter A. Margolis (155) Health Care Epidemiology
Bonnie Rogers (187) Occupational Epidemiology
Desmond K. Runyan (88) Clinical Epidemiology/Pediatrics
Mark E. Williams (105) Health Services Research

Clinical Assistant Professors
Lorraine Alexander
Robert Brown, Clinical Epidemiology, Chronic Disease Epidemiology
Daniel J. Caplan, Oral Epidemiology
Elizabeth Coonick (183) Cancer Epidemiology
Paul A. Godley (181) Cancer Epidemiology
Eugene J. Lengerich (177) Chronic Disease Epidemiology
Michael J. McMahon, Reproductive Epidemiology
William C. Miller (191), Infectious Diseases and Clinical Epidemiology
Gary Slade, Betsy Sleath, Health Care Epidemiology

Adjunct Professors
James Barrett, Environmental and Occupational 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 Conomni-Huntley (04) Aging, Physical, Cognitive, and Social Functioning
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
Harry A. Guess (121) Pharmacoeconomics
Sherman A. James (07) Psychosocial Epidemiology, Cardiovascular Epidemiology
C. David Jenkins (194), Social Epidemiology
Ulrich Keil (169) Cardiovascular Epidemiology, Occupational Epidemiology
Ruth E. Little (173) Reproductive Epidemiology
Newt MacCormack, Infectious Disease Epidemiology
Melinda S. Meade (58) Medical Geography
George Parkerson Jr., Health Care Epidemiology
Dale Sandler (90) Environmental Epidemiology
Irene C. Siegler (148) Aging
David C. Sokal (178) Reproductive Epidemiology
John W. Stamm (92) Dental Epidemiology
Hugh H. Tilton (87) Pharmacoeconomics
James F. Toole (102) Cerebrovascular Disease
Allen J. Wiltcox (61) Reproductive Epidemiology
Redef Williams (141) Cardiovascular Epidemiology

Adjunct Associate Professors
Timothy Earl Aldrich (124) Cancer Epidemiology
Elizabeth B. Andrews (140) Pharmacoeconomics
Donna D. Baird (104) Reproductive Epidemiology
Paul C. Barefoot (151) Cardiovascular Epidemiology, Psychosocial Epidemiology
Eugene Broadhead (115) Psychosocial Epidemiology
John R. Crouse (103) Cardiovascular Epidemiology
Naomar Almeido-Filho, Psychosocial Epidemiology
Russell P. Harris (125) Cancer Epidemiology, Clinical Epidemiology
Suzanne Landis, Infectious Disease Epidemiology
Stephanie London, Cancer Epidemiology
Matthew Longnecker, Environmental and Occupational Epidemiology
William F. McDonnell III (170) Environmental Epidemiology
J. Michael Moser, Chronic Disease Epidemiology, Infectious Diseases Epidemiology
Miquel Forta, Cancer Epidemiology, Clinical Epidemiology, Pharmacoeconomics
Walter J. Ragan (39) Environmental Epidemiology
Michael Rosenberg, Reproductive Epidemiology
Carol W. Runyan (154) Injury Control
David S. Strogatz (97) Psychosocial Epidemiology, Cardiovascular Epidemiology
Jane A. Weintraub (146) Dental Epidemiology
Timothy C. Wilcosky (98) Cancer Epidemiology
Bonnie C. Yankaskas (82) Diagnostic Radiology/Cancer Epidemiology

Adjunct Professors
H. Michael Arrighi (175) Chronic Disease 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
Glenda S. Cooper, Chronic Disease Epidemiology, Reproductive Epidemiology
Sara Ephiros, Chronic Disease Epidemiology
Paul J. Feldblum (186) Infectious Disease Epidemiology
Peter Garrett, Chronic Disease Epidemiology
Debra E. Irwin (176) Cancer Epidemiology, Reproductive Epidemiology
Joanne Jordan, Chronic Disease Epidemiology
Denise Lewis, Infectious Disease Epidemiology
Margaret F. McCann (100) Reproductive Epidemiology
Dexter L. Morris (113) Cancer Epidemiology
Azmi Nabulsi, Pharmacoeconomics, Cardiovascular Disease Epidemiology
Andrew S. Rowland (180) Environmental Epidemiology
Gregory P. Samu (135) Methodology
Vilma Santana, Occupational Epidemiology
Joellen M. Schildkraut (126) Cancer Epidemiology
Pamela Schwingl, Chronic Disease Epidemiology, Reproductive Epidemiology
Charles G. Smith, Environmental and Occupational Epidemiology
Paul E. Stang (163) Chronic Disease Epidemiology
Jack Taylor, Environmental and Occupational Epidemiology
Patricia S. Tennis (107) Pharmacoeconomics
Emmanuel Walter, Infectious Disease Epidemiology
Suzanne West, Health Care Epidemiology
Alice D. White (117) Cardiovascular Epidemiology

Courses

120 INFECTION DISEASE EPIDEMIOLOGY AND THE HEALTH OF THE PUBLIC (3). An overview of current problems in infectious diseases with an emphasis on factors such as human behavior, economics, and political activities which do, and will, influence public health control programs. Three lecture hours per week. Fall. Seed.

125 INJURY AS A PUBLIC HEALTH PROBLEM (MHCH 125, HBHE 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 Kotch.

140, 141 PROBLEMS IN EPIDEMIOLOGY (1 or more). A course for students who wish to make an intensive study of some special problems in epidemiology. Two or more hours a week. Fall, spring, summer. Staff.

160 PRINCIPLES OF EPIDEMIOLOGY (3). Prerequisite or corequisite, BIOS 110. Permission required for non-SPH majors. An introductory course that considers the meaning, scope, and applications of epidemiology to public health practice and the uses of vital statistics data in the scientific appraisal of community health. One lecture and two lab hours per week. Fall and spring. Shy, Alexander.

168 FUNDAMENTALS OF EPIDEMIOLOGY (4). 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 needed. An alternate to EPID 160 for satisfying the SPH core requirements. Three lecture and two seminar hours a week. Fall. Schoenbach, Rosamond.

201 EPIDEMIOLOGIC RESEARCH METHODS (3). Prerequisites, EPID 268: Introductory Biostatistics. Permission of the instructor. A second-level course in the design and conduct of epidemiologic research. Each student will be challenged by conceptual and practical aspects of developing a high quality, detailed research proposal. Spring. Weigle, Heiss.

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. Hunt.

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. Ransohoff.

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. Ransohoff.

212 EPIDEMIOLOGY OF MEDICAL CARE (3). 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. Fall. DeFrances.

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. Fall. Loomis.

214 RESEARCH ON AGING POPULATIONS (3). Prerequisites, introductory epidemiology and biostatistics. Methodologic and content issues in research on aging, including measurement of physical and mental functions, subject recruitment and selection, selective survival, attrition, co-morbidity, etc. Evaluation and discussion of critical topics. Three lecture hours a week. Spring. Slaone.

215 PUBLIC HEALTH MICROBIOLOGY (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. 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. Fall, alternate years. Wing.

218 INTRODUCTION TO METHODS IN INFECTIOUS DISEASE EPIDEMIOLOGY (1). 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, Weigle, Thomas.

219 PERINATAL EPIDEMIOLOGY (3). Permission of the instructor required. Prerequisites, EPID 160 and 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; discussions of methodologic issues specific to reproduction. Fall. Olshan, McMahon.

220 HEALTH PROMOTION/DISEASE PREVENTION AND BEHAVIORAL EPIDEMIOLOGY (3). Prerequisite, EPID 168 or permission of the instructor. Selected topics on the role that lifestyle plays in modern illness and on conceptual, methodologic, substantive, and policy issues in health promotion/disease prevention. Three lecture hours a week. Spring. Schoenbach.

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, postlicensing evaluation, vaccine coverage, and cost-benefit analysis. Three lecture hours a week. Spring. Weigle, Weber.
223 BIOCHEMICAL EPIDEMIOLOGY (3). Prerequisites, introductory epidemiology and biostatistics. Introduction to the use of biochemical markers in epidemiologic research. Emphasis is placed on markers of genotoxicity such as chromosomal aberrations, sister chromatid exchanges, micronuclei, and DNA adducts. Three lecture hours a week. Fall. Vine.

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. Spring. 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. Spring. Weigel.

227 WOMEN'S HEALTH: A LIFE CYCLE PERSPECTIVE (MHCH 227) (2). Permission required except for MHCH and EPID students. 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, spring. Zapata, Newman.

229 GENETIC EPIDEMIOLOGY: METHODS AND APPLICATIONS (3). Prerequisites, EPID 268, BIOS 145, or its equivalents, and genetics experience, or permission of the instructor. Concepts and methods of genetic epidemiology relevant to the study of complex human diseases, including research on twins, familial aggregation, path analysis, segregation analysis, linkage analysis, and gene-environment interaction. Three lecture hours a week. Spring. Newman.

232 METHODS AND ISSUES IN PHARMACOEPIDEMIOLOGY (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. Fall. Guess.

233 CANCER EPIDEMIOLOGY AND PATHOGENESIS (3). Prerequisite, EPID 160 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. Spring. Hulka.

234 CANCER EPIDEMIOLOGY METHODS (3). Prerequisites, EPID 160 or 168 and BIOS 110. Interpreting cancer statistics, lead time/length time bias, screening, causation, multistage models, study designs. Applications include: cancer in developing countries, psychosocial and public policy issues. Three lecture hours per week. Spring. Millikan.

256 CARDIOVASCULAR DISEASE EPIDEMIOLOGY (3). Prerequisite or corequisite, EPID 160 and BIOS 110, or their equivalents. Review of major issues in cardiovascular disease epidemiology, summarization of relevant pathology and analogies of population determinants and strategies for prevention. Three lecture hours a week. Fall. Heiss, Tyroler, 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.

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, Kohlmeier.

261 OBESITY EPIDEMIOLOGY (NUTR 361) (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.


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. Spring. Heiss, Davis, Tyroler.


269 ADVANCED METHODS FOR EPIDEMIOLOGIC DATA ANALYSIS (4). Prerequisite, EPID 268. Permission required for nonmajors. Concepts and applications, including logistic regression, survival analysis, model building strategy, additive and multiplicative interaction, meta-analysis, and graphical exploration. Includes computer-based experience with real data. Two lecture and four lab hours a week. Fall. Hertz-Picciotto.

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 protecting workers' health and safety. Spring. Loomis.

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. Kaluny.

301 PHARMACOEPIDEMIOLOGY 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 Epidemiology 232. May be repeated. Two seminar hours a week. Fall. Guess.

302 INFECTIOUS DISEASE SEMINAR (1-3). Prerequisites, introductory epidemiology and biostatistics. Detailed review of selected topics in infectious disease epidemiology. May be repeated for credit.

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. Fall. 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. Fall. (Alternate years.) Newman.

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. Fall, spring. Olshan.

351 ADVANCED SEMINAR IN CARDIOVASCULAR RESEARCH (1-3). Permission required. Review of substantive and methodologic research in cardiovascular and cerebrovascular diseases. May be repeated for credit. Two to six seminar hours a week. Spring. Tyroler.

358 ADVANCED NUTRITIONAL EPIDEMIOLOGY OF CARCINOGENESIS (NUTR 358) (3). Prerequisites, BIOS 145 and EPID 160 or 168; NUTR 251 or equivalent. Permission required. Examples of diet-genotype interactions in carcinogenesis will be used in the study of the tools and skills needed for nutritional-epidemiologic research. Spring. Kohlmeier.

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, Moe.

360, 361 RESEARCH IN EPIDEMIOLOGY (2-9). 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 AND HEALTH POLICY (3). Prerequisites, basic course in epidemiology and biostatistics. Epidemiology for policies on health services, environment, occupation, and pharmaceuticals. Indices/classifications, risk assessment/management, and designs/analyses are covered. Weight of evidence, research, government, industry, population, world, and media are considered. Three lecture hours a week. Spring. (Alternate years.) Elshimy.

369 READINGS IN METHODS FOR EPIDEMIOLOGY (2). Prerequisites, EPID 268 and 269, and BIOS 145. A seminar for advanced students exploring methodological issues in epidemiology, including measurement error, missing data, intermediate variables, complex study designs, meta-analysis, splines, and other topics. Spring. Hertz-Picciotto, Weinberg.

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 place of epidemiology in public health. Fall. Newman, Wing.

392 MASTER'S PAPER (1-6). Fall, spring, and summer. Graduate faculty.

394 DOCTORAL DISSERTATION. Fall, spring, and summer. Graduate faculty.

400 GENERAL REGISTRATION (0).

DEPARTMENT OF HEALTH BEHAVIOR AND HEALTH EDUCATION (HBHE)

JO ANNE L. EARP, Chair

Professors
Karl Bauman (33) Health Program and Policy Evaluation, Research Methodology, Determinants of Adolescent Behavior
Brenda M. DeVellis (13) Health Education Research, Health Behavior, Patient Education
Jo Anne L. Earp (10) Medical Sociology, Health Education Research
Elizabeth Murran (32) Aging, Family, Medical Sociology
James R. Sorenson (30) Medical Sociology and Evaluation Research
Allan Steckler (12) Citizen Participation, Health Promotion, Program Evaluation

Associate Professors
Eugenia Eng (17) Cross-Cultural Health Education, Program Strategies and Design
Susan T. Ennett (45) Adolescent Risk Behavior, Program Evaluation
Vangie Foxhee (43) Adolescent and School Health Research, Theory Testing Research
Christine Jackson (42) Research Design, Evaluation and Implementation of Community Health Promotion Programs
Carol Runyan (31) Injury Control, Policy Research and Adolescent Health

Assistant Professors
Lori Carter Edwards (58) Community-Based Research, Social Epidemiology, Primary Prevention in Underrepresented Populations
Carolyn Parks (47) Development, Implementation, and Evaluation of Health Promotion Strategies; Minority Health and High-Risk Populations
Sandra Quinn (50) Community Health, Minority Health, and Health Communications

Clinical Associate Professor
Richard House (20) Adult Education, Personnel Management

Clinical Assistant Professor
Ethel Jackson (38) Community Organization and Health Education Practice

Research Professor
Robert DeVellis (23) Health Psychology, Measurement

Research Associate Professor
Susan Blalock (39) Coping with Chronic Illness, Rehabilitation

Research Assistant Professors
James Michael Bowling (48) Survey Methodology, Evaluation, Injury Prevention
John Brian Cheuvront (52) Cancer Prevention, Risk Behavior Analysis, Applied Technology
Carolyn Crump (49) Worksite Health Promotion and Disease Prevention Instructor

Lecturers
Thomas Arcury (59) Rural Health, Applied Social Anthropology
Sallie Benedict (56) Program Planning, Women’s Health, Aging
Lynn H. Blanchard (51) Interdisciplinary Training of Healthcare Providers, Children and Health Care Needs and Community HIV Prevention
Linda Carl (60) Adult Education, Community Programs for Medical Students in Interdisciplinary Studies, Smoking Cessation
Forrest Council (55) Research Methods - Accident Records, Roadway Safety and Driver Education
Susan Gaylord (57) Preventive Medicine, Interdisciplinary Studies in Rural Health
Linda Kinnsinger (53) Primary Care Practice, Patient Education, Minority Cancer Research and Smoking Cessation
Anna Waller (54) Injury Control and Prevention, Research Methods

Adjunct Professor
Kenneth McElroy (25) Behavioral Medicine, Program Evaluation, Health Behavior

Adjunct Associate Professor
Christopher Ringwalt (40) Adolescent Drug Use and Drug Use Prevention Programs

Adjunct Assistant Professors
William Dow (37) Primary Health Care, Economic Development and Technology
Miriam Settle (46) Women’s Health; Health Promotion and Disease Prevention
Jane Vella (41) Adult Education, Cross-Cultural Program Planning

Professors Emeriti
Harriet H. Barr
Ralph H. Boatman Jr.
Leonard H. Dawson
John Hatch
Godfrey M. Hochbaum
Eunice N. Tyler

Courses

108 THE HEALTH OF U.S. POPULATIONS OF COLOR (3).
The 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. Spring. Parks.

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 Kotch.

130 SOCIAL AND BEHAVIORAL SCIENCE FOUNDATIONS OF HEALTH EDUCATION (Var.). 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. DeVellis and Mutran.

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. Earp.

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. Earp.

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 a week. Mutran.

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 intervention; strategies for evaluating programs; application of health promotion models and program planning. Spring. Crump.

189 ADOLESCENT HEALTH (PHNU 226, MCH 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 lectures a week. Spring. Fashee.

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. Fall. Mutran.

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. Norburn.

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 nonpersonal 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.

210 UNITS OF PRACTICE III: THE COMMUNITY (1-3).
Corequisite, enrollment in Health Behavior and Health Education 241, or permission of the instructor. The nature and delineation of communities as social systems; theories, principles, and practices relevant to health-related community development processes; the identification of formal and informal leadership and power structures, etc. Two lecture and seminar hours per week. Fall. 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 a week; one to three lab hours per week. Staff.

212 CITIZEN PARTICIPATION IN COMMUNITY HEALTH DECISION MAKING (1-4). Prerequisite, permission of the instructor. Theories and concepts of citizen participation in community health settings; a historical review of mandated citizen participation; and strategies for enhancing citizens' ability to influence the social policy process. One to three lecture hours; zero to two seminar hours per week. Fall. Stockler.

215 NATURAL CHANGE DETERMINANTS IN HEALTH-RELATED BEHAVIOR (3). Prerequisite, permission of the instructor. An integrated behavioral science approach to unplanned determinants to change in the health-related behavior systems of the individual, small group, and community. Fall. Staff.

225 HEALTH COMMUNICATION THEORY AND RESEARCH (3). Prerequisite, HBHE 130. Permission for nonmajors. Overview of communication of theory and research and critical analysis of applications of communication of theory to health education and health behavior intervention. Lecture-discussion format three hours a week. C. Jackson.

230 PUBLIC POLICY AND THE POLITICS OF HEALTH (HPAA 262) (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. Milio.

231 CROSS-CULTURAL CONSULTATION (3). Prerequisite, permission of the instructor. The process and content of cross-cultural and international consultation in technical assistance to developing country health programs with special reference to planned social and behavioral change. 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 technique tools 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 TEAM PROBLEM SOLVING (1 or more). Prerequisite, permission of the instructor. An experimental study of interpersonal relations in professional team settings; intra- and interteam relationship processes to large social systems, with emphasis on intervention techniques. Two or more hours a week. Spring. Staff.

240 COMMUNITY DIAGNOSIS AND NEEDS ASSESSMENT (4). Corequisite, HBHE 130. Purpose and methods for conducting community diagnosis, needs assessment, and descriptive research in health education practice. Student teams work under field preceptors to apply these methods for subsequent problem formulation and evaluation. Four lecture hours per week. Fall. (Fee $600) Quinn.

241 PROGRAM INTERVENTION DESIGN AND EVALUATION (4). Prerequisite, HBHE 240. Corequisite, Health Behavior and Health Education 250. Introduction to social and behavioral change models for designing, evaluating, and institutionalizing health education interventions. Students work under faculty advisers to develop an intervention plan in partnership with client communities and agencies. Four lecture hours per week. Spring. Quinn.

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 advisers to collaborate with local agencies and implement the plan of action developed in HBHE 241. Six lecture hours per week. Fall. Quinn.

243 PROGRAM INTERVENTION, IMPLEMENTATION, AND MONITORING II (2). Prerequisite, HBHE 242. Application of methods to analyze and interpret data regarding the effectiveness of health education interventions. Students work under faculty advisers to assess the effectiveness of interventions implemented in HBHE 242. Six lecture hours per week. Spring. Quinn.

246 PUBLIC HEALTH PROGRAM PLANNING AND EVALUATION (HPAA 246, MHCH 246, PHHNU 246, PUBH 246) (3-4). 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. Peoples-Sheps, Eng, Foshee.

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 design includes quantitative and qualitative methods and focus on application to public health practice. Four lecture hours per week. C. Jackson.

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 that contributed to decision making regarding programs. Six seminar hours per week. Summer. Staff.

252 PROFESSIONAL DEVELOPMENT SKILLS (2). Permission for nonmajors required. Four workshops will be offered, from which HBHE masters students will select three. The four subject areas covered will be technical writing, material development, grant writing, and training. Spring. Eng.

253 QUALITATIVE EVALUATION AND RESEARCH METHODS (3). Prerequisite, HBHE 250 or equivalent. Philosophy of qualitative evaluation and research studies. Collecting and analyzing qualitative data through participant observation, interviewing, group methods, and case studies. Three lectures per week. Fall. Stockler.

254 INSTRUMENT DEVELOPMENT (PHHNU 310) (3). This course provides a knowledge base and experiences in instrument construction and testing, emphasizing a broad spectrum of psychosocial and behavioral instrument scaling methodologies for field research and evaluation. Staff.

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 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 a week. Bauman.

290 CANCER PREVENTION AND CONTROL SEMINAR (EPID 290, HPAA 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. Kaluny.
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 every other year. DeVells.

301 TOPICS IN SOCIOLOGY OF HEALTH (3). Prerequisite, HBHE 130 or 131. Permission required for nonmajors. Health issues will be analyzed using social scientific methods in order to determine the research needs to develop more informed social policy. Implementation for practice will be discussed. Spring. (Alternate years.) Mutran.

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. Bauman and 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 HBEH research and interventions. Three lecture hours per week. Sorensen.

312 DOCTORAL SEMINAR: PROFESSIONAL ISSUES (3). Topics related to optimal functioning as a professionally 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. DeVells.

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 and MSPH 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.) Bauman.

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.) Mutran.

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. DeVella.

353 ADVANCED EVALUATION OF HEALTH INTERVENTION PROGRAMS (3). Prerequisites, BIOS 145, HBHE 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 program in terms of objectives, cost-benefit analysis, utility analysis. Both quantitative and qualitative methods are covered. Three seminar hours per week. Fall. Earp.

392 MASTER'S PAPER (1-6). 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.

400 GENERAL REGISTRATION (0).

DEPARTMENT OF HEALTH POLICY AND ADMINISTRATION (HPAA)

KERRY E. KILPATRICK, Chair

Professors

Associate Professors
Sally Stearns (150) Health Economics, Health Policy

**Assistant Professors**
Andrea K. Biddle (175) Health Care Access and Reform, Childhood Vaccination, Pharmaceutical Economics
Paul K. Halvetson (191) Public Health Practice and Leadership, Health Reform, Organizational Design, Applied Research, Medical Care Organization, Strategic Planning, Hospital Administration
Edward C. Norton (211) Health Care Economics, Long Term Care and Aging, Managed Care, Econometrics and Statistics

**Clinical Professors**
Thomas J. Bacon (24) Population Studies, Rural Health
Carmen Hooker Buell (219) Urban Studies, Health Care Legislation
Abraham G. Hartzena (109) Pharmacy Administration

**Clinical Associate Professors**
John J. Lee (136) Hospital Administration, Management Information Systems

**Clinical Assistant Professors**
Benjamin Gilbert (93) Health Policy, Health Law, Legislative Process
James V. Porto (134) Management and Information Systems, Public Budgeting and Finance

**Clinical Instructors**
Barbara O. Chavis (177) Health Services
Gary S. Palmer (217) Health Services Administration, Managed Care
Robert C. Schreiner (106) Information Services, Management and Development of Organizational Information Systems

**Research Associate Professors**
Deborah E. Bender (163) International Health, Maternal and Child Health Services, Community-Based Health Program Planning
Thomas R. Konrad (69) Research Methodology

**Research Assistant Professors**
Shulamit K. Bernard (218) Health Administration Research
Lucy A. Savitz (212) Strategic Planning, Marketing, Health Systems Management

**Adjunct Professors**
James D. Bader (119) Dental Public Health
Ramesh Kumar Bhat (219) Health Care Economics
Kenneth A. Bollen (220) Sociology, Methodological Research
Philip S. Brachman (190) International Health, Epidemiology and Infection/AIDS
William H. Campbell (206) Pharmacy Administration
Gordon H. DeFries (137) Health Services Research
John R. Feusner, Health Policy and Administration
Deborah A. Freund (75) Health Economics, Health Policy
Carinella Giridhar (192) International Health Care Financing, Population Management Research
Ronald J. Hunt (221) Dental Public Health
Robert R. Huntley (145) Alternative Health Care Delivery
William F. Jesse (76) Health Quality Assurance and Assessment
Mary G. Kovar (147) Aging, Health Policy
Ronald H. Levine (149) Public Health Administration and Policy
Joseph P. Morrissey (157) Health Services Research, Administrative Medicine
Eric B. Munson (92) Hospital Administration
Lalit M. Nath, Health Policy and Administration
G. Joseph Norwood (207) Pharmacoeconomics

**Adjunct Professors**
Harry A. Norkin (208) Health Services and Hospital Administration
Udhi Pareek (198) Organizational Behavior and Development, International Health
Dennis A. Revicki (209) Quality of Life Measures in Pharmaceutical Economics Research
Krishnamurthy Srinivasan (199) International Statistical Demographics of Health Care Populations
Prem P. Talwar (200) International Medical Statistics and Population Survey
Hugh H. Tilson (81) Health and Human Services, Preventive Medicine

**Adjunct Associate Professors**
Edward F. Brooks (128) Research Management, Rural Health Care Delivery, Health Manpower
Charles T. Grubb, Health Policy and Administration
Shiv D. Gupta, Health Policy and Administration
Barun K. Kanjiel, Health Policy and Administration
John J. Lee (136) VA Health Care Administration
James W. Luckey (77) Alcohol, End User Computing
Rushikesh Manu, Health Policy and Administration
David B. Matchar (158) Health Services Research, Medical Decision Analysis
Josephine A. Maukopf, Health Policy Administration
John E. Paul (116) Health Care Policy, International Health
Joseph W. Perizi (223) Health Care Quality and Accessibility
Steven J. Sloane, Health Policy and Administration

**Adjunct Assistant Professors**
Deborah A. Amaral (210) Environmental Health
Marcia A. Angle (170) Maternal and Child Health, International Health
V. Rush Baldwin (186) Pharmaceutical Health Care Costs and Outcomes
Jan P. Clement (189) Managerial Health Services Accounting and Analysis
Gary L. Freed (183) Health Care Research
Joseph W. Hales (193) Health Care Management Information Systems
Dean M. Harris (195) Health Law, Community-Based Health Issues
Frederick K. Homan, Health Policy and Administration
Teressa L. Kauf, Health Policy and Administration
David C. Kibbe (196) Quality Management
Donna J. Rabiner, Health Policy and Administration
Julie C. J. Vann (213) Health Services Delivery

**Adjunct Instructors**
Mary A. Beck (164) Health Care Administration
Allen D. Feezor (224) Health Insurance Policy Administration
Patrick M. Flynn (225) Drug Abuse Research
Michael Freeman, Health Policy and Administration
Noah D. Glick, Health Policy and Administration
Sareh F. Jaggar, Health Policy and Administration
Douglas A. Johnston (174) Health Law
Bernard R. Kingsley (179) Marketing for Nonprofit Health Care
William Parham III, Health Policy and Administration
Matthew M. Person III (181) Management Information Systems and Hospital Administration
Alan J. Reberg (226) Organizational Design and Behavior
Diana E. Ricketts (203) Health Law

**Adjunct Lecturers**
David S. Abemethy (215) Health Reform Proposals, Policy Development
Kathryn B. Ahdport (216) Organizational Design and Behavior
Majorie A. Satinsky, Health Policy and Administration

**Professors Emeriti**
James P. Dixon
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 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. It 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, or the M.H.A. requirements within three years.

Executive Master’s Program courses are available to graduate residential students on a space-available basis. Program information and an application may be obtained by calling (919) 966-7359 or (919) 966-7364, or by writing The Executive Master’s Degree Program, Department of Health Policy and Administration, School of Public Health, CB# 7400, McGavran-Greenberg Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7400.

Executive Program in Health and Population for Developing Countries

The Department of Health Policy and Administration offers the Executive Program in Health and Population for Developing Countries (EPDC), which is designed specifically for students studying or working in the developing world, especially South and East Asia and Africa. The program teaches policy and analysis, management and research skills, using linked simulations exercises based on developing world datasets. UNC faculty teach all courses in the modern facilities of the Indian Institute of Health Management Research in Jaipur, India, located about two hundred miles southwest of New Delhi. EPDC’s curriculum is modular; only one course is taught at a time over a two-week period. Students complete the M.P.H. degree in one year of full-time study or the M.H.A. degree in fifteen months.

Program information and an application may be obtained by calling (919) 966-7359 or (919) 966-1938, or by writing The Executive Program in Health and Population for Developing Countries, Department of Health Policy and Administration, School of Public Health, CB# 7400, McGavran-Greenberg Hall, The University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7400.

Courses for Graduates and Advanced Undergraduates

101 INFORMATION MANAGEMENT IN HEALTH POLICY AND ADMINISTRATION (1). 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. Allen.

104 ISSUES IN MANAGING HEALTH CARE ORGANIZATIONS (Var.). Through presentations and discussions, 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, Bender.

107 THEORY AND PRACTICE OF PUBLIC HEALTH POLICY AND ADMINISTRATION (3). Policy and management issues and ideals, 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. Bender, Veney.

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 assurance. Addressed from perspective of chief executive officer. Fall. Staff.


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.

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 public health programs. Fall. Reziow, Hunt.

128 PHARMACEUTICAL RESEARCH, DEVELOPMENT, AND MARKETING (PHAD 180) (3). This course acquaints 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.

137 CULTURAL DIVERSITY FOR HEALTH CARE ADMINISTRATORS (3). Designed to introduce students to personal and professional issues in managing cultural diversity in health care organizations. Fall. Fischer.

138 CONFLICT RESOLUTION AND NEGOTIATION FOR MANAGERS (PWAD 180) (3). Conflict resolution and negotiating skills for health care administrators. Listening, assertion, negotiation, and mediation. Fall and spring. Fischer, Gersh.

139 DEVELOPMENT OF PERSONAL EFFECTIVENESS (3). Prerequisite, permission of the instructor. Based on the assumption that personal effectiveness depends on being able to think clearly, this course encourages the development of rational thinking through understanding the relationship between thinking and feelings. Spring. Fischer.

140 READINGS IN HEALTH POLICY AND ADMINISTRATION (1-6). Staff.

141 MARKETING FOR NOT-FOR-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 not-for-profit organizations. Spring. Savitz.

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. Staff.

145 INTRODUCTION TO STRATEGIC PLANNING AND MARKETING (3). Prerequisite, permission of the instructor. An introduction to the philosophy methods and models of strategic planning in health care systems. Related disciplines include marketing, management, organizations, systems, and decision analyses. Spring. Savitz.

145 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. Schreiner.

161 STRATEGIES FOR PREVENTION (3). This course discusses the effects of public policies for prevention on rates of illness, injury, and premature death. Fall. Fischer.

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.


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. Kilpatrick.

176 INTRODUCTION TO HEALTH SERVICES RESEARCH (3). Prerequisite, MPH student. Provides systematic introduction to selected methods for health services research, health services research literature, and research writing. Fall and spring. Staff.

180 HEALTH LAW (3). The law and the legal decision-making processes and their relationship to the delivery of health services. Fall. Gilbert.

181 ETHICS AND THE PRACTICE OF PHARMACY (PHAD 181) (3). Prerequisites, PHAD 89 and PHPR 21, and permission of instructor. A discussion of ethical theories and themes that influence modern society and application of normative ethics to medicine, health care, and the profession of pharmacy. Fall. Staff.

185 ETHICAL ISSUES (3). Nature of ethical thought and reasoning; contributions of religion and science; historical and current issues. Sections on professional practice issues and health policy issues. Fall. Allen.

190 PSYCHOSOCIAL ASPECTS OF AGING (HBHE 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. Mutran.

Courses for Graduates Only

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 methodologies 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 (1). Prerequisite, HIPAA major. Supervised field experience in approved health agencies (Field fee $450). Spring. Staff.

210 MANAGEMENT OF FOREIGN AID IN HEALTH AND POPULATION (3). Prerequisites, HIPAA 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 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. Spring. Staff.

212 INTERNATIONAL COOPERATION IN HEALTH AND POPULATION (2). Prerequisite, HIPAA 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; organisational relationships; various subject areas; and methods of cooperation and assistance. Spring. Staff.

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, 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 (Var.). 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. Allen, DesHarnais, Halverson.

221 ORGANIZATION AND ADMINISTRATION OF MULTIHOSPITAL SYSTEMS (3). Prerequisite, HPA 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 and summer. Rosier.

228 ORAL EPIDEMIOLOGY FOR HEALTH POLICY AND ADMINISTRATION (3). Prerequisites, HPA 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. Rosier.

230 MANAGEMENT OF HUMAN RESOURCES IN HEALTH ORGANIZATIONS (3). Prerequisite, HPA 130 or permission of the instructor. Emphasis on clarifying concepts of human resources management and identifying the importance of human resources in health organizations. Fall and spring. Jain, Fried.

231 ORGANIZATION ASSESSMENT AND DIAGNOSIS (3). Prerequisite, HPA 130. This course explores alternative models and approaches for assessing structural and process characteristics of health service organizations. Fall. Kalumy.


233 MANAGEMENT OF ORGANIZATIONAL CHANGE (3). Prerequisite, HPA 130. The objective of this course is to improve competence in analyzing health organizations and managing planned change. Fall and spring. Fikes.

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, HPA 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. Talukdar, Savitz.

241 INTRODUCTION TO OPERATIONS RESEARCH FOR HEALTH CARE SYSTEMS (3). Prerequisite, BIOS 110 or permission of the instructor. Introduction to 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. Fall, spring. Kilpatrick.

242 ADVANCED OPTIMIZATION METHODS IN HEALTH POLICY AND ADMINISTRATION (3). Prerequisite, HPA 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, HPA 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, HPA 241 or permission of the instructor. Course will prepare students to simulate health services using the MedModel simulation software. Spring. Kilpatrick.

245 PROGRAM EVALUATION (3). Prerequisite HPA 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.

246 PUBLIC HEALTH PROGRAM PLANNING AND MONITORING (PUH 246, MHCH 246, HBEH 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. Peoples-Shipes, Bender, Foxhee, 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, HPA 247. This course focuses on goal setting, strategic development, and plan preparation with special attention to resource allocation monitoring and control. Fall. Talukdar.

249 IMPLEMENTATION AND OPERATIONS MANAGEMENT (3). Prerequisite, HPA 240. Strategic management (planning) in health care organizations in the context of institutional governance, professional groups, and regulating 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, spring, summer. Zelman.

251 MANAGEMENT ACCOUNTING FOR HEALTH ADMINISTRATORS (3). Prerequisite, HPA 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 management topics introduced in HPA 250. Spring. Zelman.

252 LONG-TERM FINANCIAL MANAGEMENT OF HEALTHCARE ORGANIZATIONS (3). Prerequisite, HPA 250. Advanced financial management concepts and practices in health service organizations, including: working capital management, capital markets, capital structure, capital budgeting, and reimbursement implications. Spring. Zelman, Asper.
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. Asper.

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. Ricketts.

261 CURRENT ISSUES IN HEALTH POLICY AND MASS COMMUNICATIONS (NURS 356) (2-3). Prerequisite, permission of the instructor. Provides an analytic skill in real world context for those who will participate in the broad process of policy formulation through their positions in the health professions and mass communication field. Spring. Millo.

262 HEALTH AND POLICY (HBHE 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. Millo.


264 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. DesHarnais, Kibble.

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. Simpson.

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. Kauf, 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. Rittenhouse.

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, Hahn.

270L MICROECONOMICS LAB (1). Corequisite, HPAA 270, and permission of the instructor for non-HPAA students. A brief summary of microeconomic theory used in Health Economics for Policy and Administration (HPAA 270). Spring. Staff.

271 STUDY DESIGN AND REGRESSION ANALYSIS (3). Prerequisite, 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.

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. Simpson.


274 ANALYSIS OF CATEGORICAL DATA (SOCI 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. Spring. Norton.

275 ANALYTIC TECHNIQUES IN HEALTH POLICY AND ADMINISTRATION (3). Prerequisite, 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). Prerequisite, 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 180. Readings, cases, and discussion of the legal and ethical aspects of delivery of health care services in the hospital setting. Spring. Gilbert.

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 seriously defective newborns. 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.
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, Simpson, Veney.

301 DOCTORAL SEMINAR IN HEALTH POLICY AND ADMINISTRATION II (3). Prerequisite, HPAA 300. Continuation of HPAA 300. Spring. DesHarnais, Ricketts, Veney.

304 SEMINAR IN TEACHING HEALTH POLICY AND ADMINISTRATION (3). Problems and processes of teaching health policy and administration, including supervised practicum experience. Fall and spring. Rozier.

305 SELECTED TOPICS IN HEALTH POLICY AND ADMINISTRATION: ADVANCED SEMINAR (3). Prerequisite, permission of the instructor. Integrated study of selected theory and research as it relates to the organization and delivery of health services. Separate seminars are developed to correspond to the doctoral student's specific interests and needs. Spring. Rozier, Kalunyn, Veney.

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. Rozier.

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. Kalunyn.

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 budget/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. Asper.

360 POLICY SEMINAR IN HEALTH POLICY AND ADMINISTRATION (1-6). Seminar on policy issues in health policy and administration. Fall and spring. Staff.

370 STRUCTURAL EQUATION MODELS WITH UNOBSERVED VARIABLES (SOCI 317) (3). Prerequisites, HPAA 273 or SOCI 209, 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, DesHarnais, Fried.

392 MASTER'S PAPER (0-3). Fall, spring, and summer. Staff.

393 MASTER'S THESIS (1-6). Staff.

394 DOCTORAL DISSERTATION (0-9). Staff.

400 GENERAL REGISTRATION (0). Staff.

DEPARTMENT OF MATERNAL AND CHILD HEALTH (MHCH)

PIERRE BUEKENS, Chair

Professors
Pierre Buekens (51) Reproductive Health, Minority Health, International Maternal and Child Health
Jonathan Kotch (17) Injury Prevention, Child Abuse and Neglect, Health and Safety in Child Care
Milton Kotchuck (1) Perinatal Health Services, MCH Program and Policy Evaluation, Adolescent Health
Amy O. Tsui (34) International Family Planning, Reproductive Health, Research Methods
J. Richard Udry (14) Sexual Behavior, Gender Roles, Adolescent Health

Associate Professors
Dorothy C. Browne (30) Health Policy Analysis, Adolescent Violence and Violence Prevention, Minority Health
Janice M. Dodds (36) 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 Associate Professor
Anita M. Farel (33) Program and Policy Development for Children with Special Health Care Needs, High Risk Infants, Public Health Practice

Joint Appointments
Leila M. Jaffe (25) Marriage, Family, and Child Development
Sandra J. Martin (40) Women's Health, Substance Use, Prison Health
Assistant Professors
Trude A. Bennett (48) Women’s Health and Maternal Morbidity; Intersection of Race, Class, and Gender in MCH; Reproductive Health and Social Welfare Policy

Adjunct Professors
Pouroh Bhiwandiwala (28) Obstetrics and Gynecology, International Women’s Health, Maternal and Child Health
Frank A. Lodha (27) General Pediatrics, Health Promotion and Disease Prevention, Adolescent Health
Thomas Vitztumone (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
Marcia Herman-Giddens (59) Child Abuse, Child Fatalities, Alternative Healing

Lynne Knauff (38) International Family Planning and Maternal Health, Training of FP/MCH Health Personnel, MCH/FP Program Development and Evaluation

Maree Meglen (42) Maternal and Child Health Service Delivery System, Nurse Midwifery

Merry-K. Moore (54) Prenatal Care, Women’s Preventive Health, Fertility Decision Making

Marcia Rose (23) Family Planning, Adolescent Pregnancy, Domestic Violence

Kevin J. Ryan (37) Statewide Delivery of Women’s Health Services, Prenatal Health, Health Care Ethics

Ann Wolfe (26) Maternal and Child Health

Adjunct Assistant Professors
Caroline Whitehead Doherty (60) Primary Farmworkers’ Health, Hispanic Health, Reproductive Health

Elaine Hart-Brothers (61) Women’s Health, Cardiovascular Epidemiology, Education and Prevention

Robert Meyer (62) Reproductive and Perinatal Epidemiology, Birth Defects Surveillance, Program Evaluations

William M. Sappenfield (44) Applied MCH Epidemiology, Perinatal Issues, MCH Planning and Evaluation

Susan Spalt (52) School Health, Adolescent Substance Abuse, HIV

Lecturers
Michael Durfee (24) Addiction Medicine, Adolescent Health Care, Handicapping Conditions and Chronic Diseases

Ruth Petersen (55) Violence in Pregnancy, Unintended Pregnancies, Adolescent Health

Jane Stein (56) Women’s Health in Developing Countries, Social Determinants of Health, Evaluation

Professors Emeriti
Sidney S. Chipman
Jaroslav Fabian Hulka
Howard Jacobson
C. Arden Miller
Earl Schaefer
Earl Siegel
Elizabeth Watkins

Associate Professors Emeriti
Geraldine Gourley
Barbara Stocking

Courses

103 REPRODUCTIVE PHYSIOLOGY AND CONCEPTION CONTROL (WMST 103) (2). Human sexuality, reproductive physiology, methods of regulation; pregnancy, fetal wastage, infertiltiy, sterilization, abortion and community responsibilities discussed. Two lecture hours a week. Fall. Staff.

110 DEMOGRAPHY OF WOMEN AND CHILDREN IN DEVELOPING COUNTRIES (2-3). 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.

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, socioeconomic 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, 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 instructors. For students outside the department of MCH who desire a survey of current issues and programs in maternal and child health. Emphasis is on contemporary approaches to problems and services affecting children and families. Three lecture hours per week. Spring. Margolis.

205 INTERNATIONAL FAMILY PLANNING (3). Permission required. Prerequisites, 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. Fall or spring. (Alternate years.) 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. Spring. Kotcheluck.

208 CONCURRENT FIELD TRAINING IN MATERNAL AND CHILD HEALTH (1-4). Prerequisite, MCH major. 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-approved 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 (2). 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. Two 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. Two lecture hours and two seminar hours per week. Fall. Bennett.

211 CHILD AND FAMILY HEALTH (3). Prerequisite, MCH 210. Permission required for non-MCH majors. This course addresses major issues in child and adolescent health including interactions among children, their families, and environment. Following a developmental paradigm, emphasis is given to preventive public health services. Three lecture hours per week. Spring. Kocn.
211 CHILD AND FAMILY HEALTH LAB (1). Prerequisites, MHCH 210; corequisite, MHCH 211. Permission required for non-MHCH 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. Koehntop, staff.

213 RESEARCH AND EVALUATION METHODS IN MATER-\nal AND CHILD HEALTH (3). Permission required for non-MHCH majors only. The art and science of MCH research and evaluation 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. Spring. Bukena, Stein.

213L RESEARCH AND EVALUATION METHODS IN MATER-\nal AND CHILD HEALTH LAB (1). Prerequisite, MHCH 213. Permission required for nonmajors. The MHCH 213 Lab, which is a companion course to MHCH 213, introduces students to statistical analysis using SAS-PC and microcomputers. Two lab hours per week. Spring. Staff.

214 FIELD TRAINING IN MATER-\nal 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-approved field instructor. An additional field fee of $350 is assessed. Fall, spring, and summer. Minimum of six weeks.

220 ORGANIZATION OF SERVICES FOR CHILDREN WITH SPECIAL HEALTH NEEDS (3). Permission of the instructor. This course focuses on the design, organization, and implementation of services for children with special needs. Participants analyze the range of services needed by these children. Spring. Farell.

222 ISSUES IN INTERNATIONAL MATER-\nal 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 or spring. Staff.

224 SCHOOL AGE POPULATION: HEALTH PROBLEMS AND PROGRAMS (PHNU 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.

225 PRACTICUM: LEADERSHIP IN SCHOOL HEALTH PRO-\grams (PHNU 225) (1-4). Prerequisites, Maternal and Child Health 224 or equivalent and permission of the instructor. An elective, individually planned and supervised school-community based field experience. Designed to provide leadership experiences in delivery of school health services. Spring. Staff.

226 ADOLESCENT HEALTH (PHNU 226, HBHE 189) (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. Fooshee.

227 WOMEN'S HEALTH: A LIFE CYCLE PERSPECTIVE (EPID 227) (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. (Alternate years.) Newman and Zapata.

230 REPRODUCTIVE HEALTH POLICY (3). Permission of the instructor required. This seminar examines forces that shape 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 class explores innovative research strategies and methodologies relevant to the health of minority populations. Specific topics include racial 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. Brown.

246 PUBLIC HEALTH PROGRAM PLANNING AND MONI-\TORING (HPAA 246, PHNU 246, HBHE 246, PUBH 246) (2 or 4). Prerequisites, two years of work experience. Permission required for nonmajors in SPH. Fundamentals of public health program planning and monitoring with emphasis on 1) applications in community settings, and 2) proposal development for program funding. Spring. Peoples-Shpe, Fooshee, Bender, Eng.

252 INTERNATIONAL MCH RESEARCH SEMINAR (1). Permission required for non-MCH majors. Students explore international health issues either singly or in a team. Each student selects a topic, provides readings, and presents or facilitates discussion on that topic. Strongly recommended for MCH International Health Concentration students. Two seminar hours per week. Spring. Stein.

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.

260 CONCEPTUALIZATION, DESIGN, AND MEASUREMENT (3). Permission required of nonmajors and master's students. Prerequisite, MHCH 213, or its equivalent. The course focuses on study design and measurement following a research project from the formulation of research questions to the design, to the development of research methodology, and the development of appropriate measurements. Three lecture hours a week. Fall. Martin.

261 MCH SECONDARY DATA ANALYSIS (3). Permission required for nonmajors and master's students. Prerequisite, Knowledge of SAS, MHCH 213, or its equivalent. Analytical skills enhancement seminar focusing on the use of secondary data analysis for MCH evaluation and planning. Students are exposed to all phases and issues surrounding the use of secondary data through student practicum projects. Knowledge of SAS required to conduct course project. Three lecture hours a week. Spring. Korbeluck.

262 MCH PROGRAM EVALUATION (3). Permission required for nonmajors and master's students. Prerequisite, Knowledge of SAS, MHCH 213, or its equivalent. Analytical skills seminar focusing on the theory and practice of MCH program evaluation. Through examples of MCH program evaluation 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. (Alternate years.) Korbeluck.

300 DOCTORAL SEMINAR IN MATER-\nal AND CHILD HEALTH (2). Permission required for nonmajors and master's students. This seminar explores the major MCH policy and philosophical controversies and dilemmas that provide the paradigms for maternal and child health policy development. Two lecture hours a week. Fall. Browne.
DOCTORAL SEMINAR IN MATERNAL AND CHILD HEALTH (2). Permission required for nonmajors and master's students. Prerequisite, MCH 300. This seminar explores the origins of 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, summers.

DOCTORAL RESEARCH SKILLS COLLOQUIUM (1). Permission required for nonmajors 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, Farel and summer.

SEMINAR IN MATERNAL AND CHILD HEALTH PRACTICE (2). Nonmajors require permission of the instructor. This seminar provides an opportunity for students and faculty to explore in greater depth selected subjects within the field of maternal and child health. Fall and summer. Staff.

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.

MASTER'S PAPER (1-4). Fall, spring, and summer.

MASTER'S THESIS (3-6). Fall and spring.

DOCTORAL DISSERTATION (3 or more). Fall, spring, and summer.

DEPARTMENT OF NUTRITION (NUTR)

STEVEN H. ZEISEL, Chair

PROFESSORS

John J. B. Anderson (2) Diet and Bone Indices in Women, Diet and Body Composition, Diet and Aging

Stephen G. Chaney (43) Mechanism of Action of Platinum Anticancer Agents, DNA Repair, HPLC Methodology

Rosalind A. Coleman (39) Lipid and Carbohydrate Metabolism, Folic Acid Metabolism, Glycogen Storage Disease

William D. Hether (46) Gastrointestinal Absorption, Malabsorption Syndromes, Consequences of Long-Term Parenteral Nutrition in Hospitalized Patients, Digestive Diseases Causing Malnutrition

Lenore Kohlmeier (52) Dietary Assessment Methodologies, Nutrition and Cardiovascular Disease Epidemiology, Antioxidants and Cancer Epidemiology

Robert G. McMurray (51) Physiology of Exercise

Barry M. Popkin (17) Dietary Trends and Determinants in the U.S., China, and Russia; Demographic and Nutrition Interactions; Interplay Between Socioeconomic and Biomedical Factors as They Affect Nutritional Outcomes

Ronald Thurman (49) Compartmentation of Metabolism of Nutrients and Drugs Within the Liver, Alcohol Metabolism by Liver as Well as in Transplantation of Liver

Louis E. Underwood (45) Insulin-Like Growth Factors and Their Effects in Obesity, Fetal Growth, and Dietary Restraint

Steven H. Zeisel (38) Transmembrane Signal Transduction (Diacylglycerol and Protein Kinase) and Carcinogenesis in Liver, Choline Metabolism and Requirements Especially in the Human Neonate, Regulation of Lactation

RESEARCH PROFESSOR

Martin Kohlmeier (53) Biomarkers in Nutritional Epidemiology, Lipid Metabolism

ASSOCIATE PROFESSORS


Janice M. Dodds (36) Nutrition Policy, Leadership Development in Public Health Nutrition, Community-Based Program Implementation

Anthony C. Hackney (50) Endocrine and Metabolic Responses to Physical Stress, Physiology of Exercise

Pamela S. Haines (32) Determinants of Dietary Intake, Nutrition Epidemiology, Nutrition and Public Health Policy

June Stevens (56) Anthropometry, Obesity and CHD Epidemiology, Minority Health, Dietary Fiber and Health

Boyd R. Switzer (5) Dietary Fat, Fiber, Cancer, Nutritional Assessment and Biochemistry; Nutrition and Immunology

RESEARCH ASSOCIATE PROFESSOR

Barbara H. Dennis (40) Cardiovascular Nutritional Epidemiology, Dietary Assessment, Cultural Determinants of Food Habits

ASSISTANT PROFESSORS

Alice D. Ammerman (41) Design and Testing of Dietary Intervention Approaches for Cardiovascular Disease Risk Reduction, Dietary Knowledge, Attitudes and Treatment Practices of Physicians/Physicians in Training; Nutritional Epidemiology, Dietary Assessment Methodology

Melinda Beck, Relationship between Antioxidant Nutrition and Infectious Disease

Kerry Ann daCosta (58) Dietary Factors (Methyl Groups) and Cancer

Mark Konuda (47) Effect of Parenteral Nutrition Supplemented with Short Chain Fatty Acids on the Small Bowel, Effect of Dietary Fish Oil on Prostaglandin Synthesis

Dexter Louie (42) Neurohormonal Control of Exocrine Pancreatic Secretion, Signal Transduction, Molecular Biology of Receptor Function

RESEARCH ASSISTANT PROFESSORS

Craig D. Albright, Nutrient Modulation of Receptor-Mediated Signaling, Apoptosis, and Carcinogenesis

Marc K. Campbell (57) Nutritional Behavior Change for Health Promotion and Disease Prevention

Anita Lesswell (20) Nutrition Education in Medicine, Nutrition and Health Behavior, Nutrition and Cancer Prevention

Gwen Murphy, Juvenile Onset Diabetes

Anna Maria Seiga-Riz, Maternal Nutrition and Birth Outcomes, Adolescent Dietary Habits, Minority Dietary Trends, Reproductive Epidemiology

Namvar Zohoori (60) Nutrition Epidemiology, Population and International Nutrition

ADJUNCT ASSOCIATE PROFESSOR

Thomas J. Chegash (29) Food Service Systems Management

CLINICAL PROFESSOR

John B. Longenecker (44) Dietary Amino Acid Intake, Effects of Long-Term Nutrition on Aging

CLINICAL ASSOCIATE PROFESSORS


Amy Levine (61) Psychosocial Correlates, Treatment, and Medical Complications of Obesity in Pediatric and Adolescent Populations

RESEARCH INSTRUCTORS

Karen Cooksey (6) Nutrition Education in Medicine, Nutrition Research and Clinical Trials

Bobette Jones, Women's Health Issues, Diet and Disease

Kristine Kelsey, Health Promotion and Disease Prevention, Behavior Change, Obesity Prevention
Professors Emeriti
Joseph C. Edozien
Mildred Kaufman
Associate Professor Emerita
Rebecca B. Bryan
Clinical Associate Professor Emerita
MaryAnn C. Farthing

Courses
100 INTRODUCTION TO MEDICAL NUTRITION (3).
Prerequisites, CHEM 11, 21, and BIOL 11 or equivalents, or permission of
the instructor. Function of the human body focusing on nutrient interac-
tion. 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, BIOL 62, CHEM 61, or equivalent.
Covers normal cell biochemistry and physiology, emphasizing roles of
nutrients throughout the life cycle; chemistry and metabolism of
proteins, nucleic acids, carbohydrates and lipids; endocrine/neuroendocrine regu-
lation of metabolism. Fall. Louie.

111 NUTRITION OF CHILDREN, MOTHERS, AND THE
ELDERLY (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, chil-
dren, and adolescents. Fall. Adair.

112 NUTRITION IN THE ELDERLY (1). 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 nutri-
tion in health and various disease states of the elderly. Fall. Zohoori.

120 NUTRITIONAL BIOCHEMISTRY AND DISEASE
PROCESSES (3). Prerequisite, NUTR 110. Covers biochemistry and
pathophysiology of diseases with emphasis on roles of nutrients in preven-
tion causation, and/or therapy. Materials from prerequisite used as basis
for study of molecular mechanisms responsible for disease processes.
Spring. Anderson.

121 CLINICAL APPLICATIONS: DIET THERAPY (3).
Corequisite, NUTR 120. Course designed to examine the rationale and
implementation of diet therapy and nutrition support in the prevention or

130 FOOD ECOLOGY (3). Prerequisite, NUTR 40 or equivalent.
Social, economic, cultural, and psychological influences on food con-
sumption patterns of individuals are examined. Emphasis is on major eth-
nic groups represented in the United States. Implications for intervention
approaches are explored through case studies. Fall. Jackson.

132 DIETARY CHANGE IN INDIVIDUALS (2). Prerequisite,
NUTR 40 or equivalent. Functions of a nutritionist working with individ-
uals, emphasizing interviewing, assessment, nutrition care planning, coun-
seling, and service documentation in prevention and therapeutic situa-
tions. Practice in the use of current dietary analysis software programs and
development of educational materials included. Spring. Barrett.

140 FOOD SCIENCE AND MEAL PREPARATION (2).
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 $25. One lecture hour and two laboratory hours per week.
Fall. Barrett.

141 FOOD SERVICE SYSTEMS MANAGEMENT (3). Permission
of the instructor required for nonmajors. 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 lab-
atory hours per week. Fall, spring.

142 FOOD PRODUCTION, PROCESSING, AND PACKAGING
(2). 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 (2). Prerequisite,
NUTR 40. Introduction to program and policy approaches for improving
nutritional status of populations. Broad basis and rationale for nutrition
policy introduced. Design, implementation of relevant food, nutrition,
health programs examined. Spring. Haines.

170 READINGS IN NUTRITION (1-9). Prerequisite, permission of
the instructor. Reading and tutorial guidance in special areas of nutrition.
Fall, spring, summer. Faculty.

190 NUTRITION RESEARCH (1-9). Prerequisite, permission of the
instructor. Individual arrangements with faculty for bachelors and masters
students to participate in ongoing research. Fall, spring, summer. Faculty.

210 NUTRITION ASSESSMENT (1-3). Prerequisite, NUTR 100 or
permission of the instructor. This course is taught as three independent
one-credit modules. Dietary Assessment (theory and rationale of nutri-
tional assessment in individuals and populations; one credit).
Anthropometric Assessment (one credit). Clinical/Laboratory
Assessment (one credit). Spring. Switzer.

220 CLINICAL NUTRITION EXPERIENCE (0-6). Prerequisites,
NUTR 120, 121, 132. Students are assigned to medical facilities where,
under supervision of registered dietitians, they participate in the nutri-
tional care of patients. Field fee of $450. Forty hours per week for twelve
weeks. Summer. Barrett and field preceptors.

230 DIETARY CHANGE INTERVENTIONS (3). Prerequisites,
NUTR 130, 150. Focus on developing theory-based nutrition interven-
tions at the population level. Addresses levels of interventions such as
schools and work sites; methods of implementation including social mar-
keting and mass media; curriculum analysis and principles of assessing
change. Spring. Campbell.

250 PUBLIC HEALTH NUTRITION MANAGEMENT I (4).
Prerequisite, NUTR 150. Addresses roles and functions of the health care
team and nutritionists 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 (4).
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 (4). 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, sum-
mer. Dodds, Switzer.

253 NATIONAL NUTRITION ISSUES (1). 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 (3). 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. Stevens.

261 INTERNATIONAL NUTRITION (3). Critical view of the dimensions of world problems in nutrition, with emphasis on micro and macro determinants of malnutrition. Analysis of programs and policies for eliminating malnutrition. Fall. Popkin.

262 INTERNATIONAL NUTRITION: SPECIAL TOPICS (1). 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 (1). 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. Levine.

305 NUTRITIONAL METABOLISM (3). 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. Coleman and nutrition biochemistry faculty.


311 ADVANCED NUTRITIONAL BIOCHEMISTRY GENETICS (2). Prerequisites, NUTR 110, 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. Kohlmeier. (Alternating years.)

315 NUTRIENTS AND DISEASE (2). Prerequisite, NUTR 120 or equivalent. A problem-based approach to understanding mechanisms whereby nutrients influence human disease processes. Students develop answers to questions about biochemical mechanisms, interpret data, design experiments studying cancer, osteoporosis, and other diseases. Spring. Zeisel and nutrition biochemistry faculty.

320 NUTRIENTS AND DISEASE: MINERALS (2). Prerequisites, NUTR 110 and 120 or equivalent. A seminar reviewing the nutrition and metabolism of the major minerals, with a focus on calcium and phosphorus. Spring. 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 323. daCosta.

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. Spring. (Alternating years.) Switzer.

323 NUTRIENTS AND DISEASE: BRAIN FUNCTION AND DEVELOPMENT (2). Prerequisites, NUTR 110 and 120 or equivalent. Seminar on nutrients that influence brain and neuron development and function. Spring. (Alternating years.) Zeisel.

325 ADVANCES IN CARBOHYDRATE AND LIPID METABOLISM (1). Prerequisites, MEDI 120, NUTR 310, or equivalent. Seminar discussions of recent papers related to carbohydrate and lipid metabolism, including fatty acid regulation of gene expression, glucose transporters, genetic defects causing diabetes, w-3 fatty acids in neural development. Spring. Coleman.

330 NUTRITION AND BEHAVIOR RESEARCH (2). Prerequisite or corequisite, NUTR 130 or permission of the instructor. Measurement and research issues are investigated through a critical review of the literature concerning determinants of dietary intake, theory-based approaches to behavior change, and behavioral responses to nutrient consumption. Fall. (Alternating years.)

350 ADVANCED NUTRITION POLICY (3). Prerequisites, NUTR 130, 150, or permission of the instructor. Students evaluate nutrition-related programs and policies including interventions designed to achieve individual and organizational behavioral change, and governmental regulations and laws which influence the nutrition of the population. Spring. 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.

358 ADVANCED NUTRITIONAL EPIDEMIOLOGY OF CARCINOGENESIS (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. Spring. Kohlmeier.

360 ANALYTICAL METHODS IN NUTRITIONAL EPIDEMIOLOGY (3). Prerequisites, EPID 160 or 168, NUTR 259, and BIOS 145. Teaches advanced skills for studying diet and anthropometry, including measurement of dietary intake, use of nutritional datasets, application of epidemiologic and statistical methods, and use and interpretation of anthropometric indices. Fall. (Alternating years.) Siega-Riz and Zohoori.

361 OBESITY EPIDEMIOLOGY (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.


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. (Alternating years.) Popkin, Zeisel.

373 JOURNAL CLUB (0-1). Critical review of current literature in nutritional biochemistry, applied nutrition, and population-based nutrition science. Focuses on the development of skills in reviewing and critiquing journal articles. Fall, spring. Adair.

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. daCosta.

375 NUTRITION RESEARCH (1-9). Individual arrangements with faculty for doctoral students to participate in ongoing research. Fall, spring, summer. Staff.

392 MASTERS PAPER (0-6). Fall, spring, summer. Faculty.

393 MASTERS THESIS (0-6). Fall, spring, summer. Faculty.
PUBLIC HEALTH LEADERSHIP PROGRAM (PUBH)

ARNOLD D. KALUZNY, Director
William A. Sollecito, Associate Director
Saundra E. Endress, Distance Learning Coordinator
Timothy S. Carey, Health Care and Prevention Co-Coordinator
Russell P. Harris, Health Care and Prevention Co-Coordinator
Bonnie Rogers, Occupational Health Nursing Coordinator
Rachel H. Stevens, Public Health Nursing Coordinator

Professors
Jean Goepinger (62) Health Promotion and Leadership
Arnold D. Kaluzny (66) Public Health Leadership, Organizational Design and Behavior, Program Implementation and Evaluation
R. Gary Rozier (73) Public Health Leadership, Dental Public Health
Marla E. Salmon (5) Occupational Injuries, Women's Leadership, and Health Services Research
James E. Veney (74) Public Health Leadership, International Health Research and Evaluation Methodology, Statistical Applications

Associate Professors
Janice M. Dodds (64) Community-Based Public Health Initiatives
Eugenia Eng (75) Public Health Practice, Cross-Cultural Health Education, Program Strategies and Design
William D. Kalsbeek (71) Biostatistics, Survey Analysis, Sample 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 Professors
Timothy S. Carey (69) Health Care and Prevention
Vangie A. Foshee (25) Adolescent Drug Use and Dating Violence Research
Russell P. Harris (68) Health Care and Prevention

Research Professor
William A. Sollecito

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
Saundra E. Endress (21) Mental Health, Education, and Leadership
Paul K. Halverson (67) Public Health Leadership, Health Administration
Lorraine B. Johnson (22) Chronic Illness and Health Promotion

Research Associate Professor
Frances M. Lynn (65) Environmental Resources and Public Health Leadership

Research Assistant Professor
G. Fletcher Linder (61) Adolescent Drug Use and Dating Violence Research

Lecturer
Elizabeth M. Tornquist (18) Research Methodology, Scientific Writing

Clinical Instructor
Judith S. Ottendorf (57) Occupational Health Nursing

Research Instructor
Christina A. Harlan (45) Migrant Health

Adjunct Professor
Jan R. Atwood (23) Cancer Prevention and Aging, Health Promotion, and Research Instrument Development and Methodology

Adjunct Assistant Professors
Brenda L. Cleary (60) Public Health Policy
Carol Cox (41) School Health Nursing
Linda Frazier (49) Ergonomics and Education in Occupational Medicine
Betty B. Griffith (36) School Health Nursing
Therese P. Lawler (28) Public Health Nursing Education
Constance F. Mullenix (54) Public Health Policy
Elizabeth Randall-David (37) Culture and Health, AIDS
Craig R. Stenberg (46) Occupational Mental Health
Irene A. Tessaro (56) Public Health Practice
Nancy L. Tigar (14) Public Health Nursing Administration

Adjunct Clinical Instructor
Karen Mastroianni (48) Occupational Health Nursing

Adjunct Instructors
Marilyn Asay (31) School Health Nursing
Patricia K. Bertsche (42) Occupational Health Nursing
Janet Braunstein (44) Home Health Care and Fitness
Dolores Brookshire (34) Occupational Health Nursing
Maureen M. Miller (53) Health Administration, Health Policy Analysis
 Kathleen E. Peterson (39) Adult Health and Public Health Administration
Susan A. Randolph (35) Occupational Health Nursing
Emily G. Rivenbark (30) Continuing Education

Professors Emeriti
Nora F. Cline
Marion E. Highriter
Dorothy M. Talbot
Julia D. Watkins

Courses
* PUBH 140 READING IN PUBLIC HEALTH PRACTICE (Var.). Intensive study of a special problem in public health practice. Fall, spring, and summer. Staff.

* PHNU 140, 141, 142 READING 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.

* The Public Health Leadership Program uses both PUBH and PHNU call letters for course listings. PUBH courses open to any student unless requiring permission of instructor. PHNU courses open for registered nurses only or by permission of instructor.
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 depend upon credit. Fall and spring. 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. Kincade.

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.

PHBU 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. Foshee.

PHBU 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 results 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 a broad spectrum of psychosocial and behavioral instrument scaling methodologies 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 departments. Emphasis on program areas in health departments and public health under health care reform. Three lecture hours per week. Fall.

PHBU 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.

PHBU 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) proposal development 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-Shen, Bender, Eng, Foshee.

PHBU 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.

PHBU 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. Mullinix.

PHBU 249 PROGRAM EVALUATION (2). Permission of the instructor required. Program evaluation methods, including quantitative, qualitative, and quality assurance. Spring. Foshee.

PHBU 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. 1.5 hours per week for fall and spring. Kinzinger, Harris.

PHBU 251 SEMINAR IN CRITICAL APPRAISAL OF MEDICAL LITERATURE (1-2). Emphasizes the process of critical appraisal of existing research literature, with examples from a variety of areas. Student presentations of structured critical appraisals constitute about fifty percent of sessions. Spring, fall. Carey, Weber.

PHBU 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.

PHBU 260 CLINICAL MEASUREMENT/EVALUATION (3). Introduction to clinical epidemiology designed for those with interest in the clinical arena. Provides a broad-based introduction with emphasis on clinical research, clinical practice, and health care policy.

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 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 nursing programs. General and special health services contingent on work environment and inherent health problems in the employed populations 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 286 OCCUPATIONAL SAFETY AND ERGONOMICS (Environmental Sciences and Engineering 147) (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.

PHNU 298 RESEARCH METHODS (2-3). Prerequisites or corequisites, 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 prepared 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.

PHBH 300 LEADERSHIP SEMINAR I (2). Permission of the instructor required. Public health leadership core course. Application of selected leadership skills and principles. Summer. Staff.

PHBH 301 LEADERSHIP SEMINAR II (2). Permission of the instructor required. Public health leadership core course. Application of selected leadership skills and principles. Fall. Staff.

PHBH 302 LEADERSHIP SEMINAR III (2). Permission of the instructor required. Public health leadership core course. Spring. Staff.

PHBH 303 LEADERSHIP SEMINAR IV (2). Permission of the instructor required. Public health leadership core course. Summer. Staff.

PHBH 304 CURRENT METHODS OF PUBLIC HEALTH ANALYSIS (1-3). Permission of the instructor required. Public health leadership core course. Update on current methods of biostatistics, epidemiology, and automated data management. Summer. Staff.

PHBH 305 PUBLIC HEALTH POLICY DEVELOPMENT I (2-3). 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.

PHBH 306 PUBLIC HEALTH POLICY DEVELOPMENT II (2-3). Prerequisite, PHBH 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.

PHBH 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.

PHBH 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.

PHBH 31 LEADERSHIP, PRACTICE, AND RESEARCH I (1-3). 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.

PHBH 312 LEADERSHIP PRACTICE AND RESEARCH II (1-3). 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.

PHBH 392 MASTER'S PAPER (1-3). 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.

PHBH 393 MASTER'S THESIS (3-9). Fall, spring, summer. Staff.

PHBH 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.

PHBH 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.

PHBH 396 FIELD PRACTICE IN COMMUNITY HEALTH NURSING (3-6). Permission of the instructor required. Field work 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.

PHBH 400 GENERAL REGISTRATION (0).

CURRICULUM IN PUBLIC POLICY ANALYSIS

MICHAEL I. LUGER, Chair

Professors
Richard N. L. Andrews*, Environmental Policy
David D. Dill, Education Policy, Concepts and Principles of Policy Analysis

*signifies membership on the Dean's Advisory Committee
Critical world problems do not fit neatly into one framework. The Ph.D. program in Public Policy Analysis 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 Analysis. Our 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 Analysis) and in other graduate programs offered by the departments of City and Regional Planning, Economics, Environmental Sciences and Engineering, Political Science, Master of 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.

Admission

Applications for admission in the fall semester are received and reviewed throughout the year. Applications must be received before January 1, however, to be considered for Graduate School fellowships and available 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.

Policy Field Concentration

The Ph.D. program in the Curriculum in Public Policy Analysis is designed to train scholars and analytical thinkers to solve real world problems that spill over traditional disciplinary lines.

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Business 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.

Ph.D. in Public Policy Analysis

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twenty-seven credit hour requirement gives students rigorous training in applied policy analysis for public decision making. Course work in the policy area and its substantive theory will meet half of that requirement. To sharpen methodological skills for original research, a minimum of twelve credit hours in research methods are required. And to understand the complexities of policy implementation, students must complete coursework on the political/administrative process within their specific field.

**Public Policy Analysis Seminar**

The curriculum hosts a seminar series that invites faculty, public policy scholars, government officials, and public policy doctoral students to present 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.

**Curriculum Requirements**

**The Core**

The first four semesters of study build a solid foundation for the Ph.D. curriculum in Public Policy Analysis. All core courses are designed specifically for public policy doctoral students. The courses 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.

Graduate students in other programs at UNC or nearby universities may elect to minor in Public Policy Analysis.

**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 in-state tuition privileges, 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 community and economic development, housing market dynamics and national homeownership policies, models of urban growth, residential preferences, coastal zone management, planning for natural hazards, and sustainable development.

**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.
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 Economic Development
Conducts research, policy analysis, and professional instruction on the public and private economic development of localities, regions, and states in the United States and abroad.

Institute for Environmental Studies
Supports multidisciplinary research on broad aspects of environmental quality in the natural and social sciences, engineering, and public health.

Institute of Government
Provides teaching, research, and consultation to North Carolina state and local government officials.

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.

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.

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
Curriculum in Public Policy Analysis
Campus Box 3435, Abernethy Hall
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3435
(919) 962-1600
World Wide Web: www.unc.edu/depts/pubpol

Graduate Courses

100 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. Villani.


175 QUANTITATIVE ANALYSIS FOR PUBLIC POLICY (POLI 175, PLAN 175) (3). Prerequisite, STAT 23. Application of statistical techniques, including regression analysis, in public policy program evaluation; research design and data collection and management. Spring. Staff.

190 SEMINAR IN DOMESTIC POLICY (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.

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. 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. Dill.

208 ANALYSIS FOR RISK MANAGEMENT (ENVR 258, POLI 208) (3). 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 (POLI 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) (3). Development of administrators' skills in working with others to accomplish organizational goals. Conceptual and experiential models of learning used to examine a variety of administrative behaviors. Spring. Whitaker.

212 INTRODUCTORY POLICY EVALUATION METHODS (POLI 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. Lowery, Munger.

214 GOVERNMENT BUDGETING AND FINANCE (POLI 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.

225 PUBLIC ECONOMICS FOR PLANNING AND POLICY (PLAN 225) (3). The economics of the public sector, including welfare economics and cost-benefit analysis, principles of federal finance, regulation, trade, and related topics. Applies theory to planning and policy problems. Fall. Staff.

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. Staff.

233 ETHICS AND FORMAL ANALYTICAL 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. Whittington, Cassidy.

235 VALUES AND ETHICAL PERSPECTIVES ON PUBLIC POLICY (POLI 235) (3). Understanding and clarifying the valutational 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, PUPA/POLI 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, Munger.


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, PUPA 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. Luger.

298 PUBLIC POLICY WORKSHOP (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. Spring. Stegman.

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 (PLAN 300) (3). Systematically examines and uses research of policy-relevant research in public process; connects design and execution of policy research with participants in public 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.


310 PUBLIC POLICY SEMINAR (1). Biweekly 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. Luger.

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.

394 DOCTORAL DISSERTATION (credits variable). Staff.

400 GENERAL REGISTRATION (0).

DIVISION OF REHABILITATION PSYCHOLOGY AND COUNSELING

CATHERINE NIELSON, MPH, OT/L, Interim Director, Clinical Associate Professor

Professor
Robert Sakata (1) Administration, Research and Curriculum, Graduate Education

Associate Professor
Cynthia L. Wilhelm (5) Pediatric/Adult Rehabilitation Psychology, Psychosocial Adjustment of Disability, Disability Evaluation/Management

Assistant Professors
Eileen J. Burka (22) Behavioral Medicine, Health Psychology, Stress, Appraisal and Coping with Heart and Lung Transplantation, Psychological Aspects of Cardiac and Pulmonary Rehabilitation, Eugene F. Pichette (24) Vocational Assessment, Multicultural Issues, Research Methodologies

Clinical Associate Professor
J. Gregory Olley (20) Developmental Disabilities, Development of Social Behavior, Staff Development and Human Services

Clinical Assistant Professor

The Division of Rehabilitation Psychology and Counseling (DRPC) of the Department of Medical Allied Health Professions offers a two-year graduate program leading to the Master of Science degree.

Mission, Goals, Objectives

The division operates under the premise that the rehabilitation of individuals with disabilities is a continuous process, consisting of many progressive steps in the optimization of independent living and vocational/career development. Rehabilitation is viewed from a broad perspective, taking into consideration the total individual within the context of a complex social, economic, and political environment. Rehabilitation outcomes are to be viewed as transitional and dynamic. Consideration must be given to changing needs arising from the individual striving to attain new levels of coping and adjustment. Successful rehabilitation also critically depends on a responsive and accommodating environment. Consistent with the foregoing, the DRPC has chosen the following mission:

The DRPC accepts as its mission the graduation of competent practitioners, the continuing advancement of skills and
knowledge through the integration of recent research findings, innovations in instrumentation and technology, and the evaluation of the impact of new strategies and approaches on established rehabilitation service systems. The mission includes acting as a resource for consultative/clinical services to the community and actively engaging in relevant research. Participation in other scholarly and professional activities will also be encouraged.

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 enrolled in this two-year master's program must complete 35+ hours of core academic course requirements, plus two semesters of practicum and one semester of internship. Students are encouraged to take courses in areas allowing for specialization within the field of rehabilitation psychology and counseling.

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 scores.
- Three letters of recommendation.
- A pre-admission interview with the Rehabilitation Psychology and Counseling 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/Burker.

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. Pichette.

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. Pichette.

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. Staff.

216 REHABILITATION COMMUNITY ORGANIZATION (3). Introduction to community-based treatment facilities and programs. The identification of rehabilitation community organization: structural, political, and economic. Three lecture hours per week. Fall. Wilhelm.

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 experimental point of view. Students explore 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, 306. 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 evaluation, 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. 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. This advanced course is 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.

393 MASTER'S THESIS (3). Fall, spring, and summer. Staff.

400 GENERAL REGISTRATION (0).

DEPARTMENT OF RELIGIOUS STUDIES

CARL W. ERNST, Chair

Professors
Carl W. Ernst (42) Islamic Studies, Sufism, South Asia
David J. Halperin (14) Judaism in Antiquity; Jewish Mysticism; Comparative Study of Judaism, Christianity, and Islam
Peter I. Kaufman (16) History of Christian Traditions; Patristic, Medieval, and Reformation Studies
Jack M. Sasson (9) Ancient Near Eastern Studies
Ruel W. Tyson Jr. (13) Philosophy and Anthropology of Religion, Ethics and Rhetoric
John Van Seters (3) Old Testament Studies

Associate Professors
Laurie Maffly-Kipp (29) History of Religion in America, African American Religion
Tomoko Masuzawa (28) Religion and Literature, Critical Theory, Cultural Studies
James H. Sanford (8) Far Eastern Religions, Japanese Buddhism
Thomas A. Tweed (47) Historiography of Religions in America, Asian Religions in America
Joanne P. Waghorne (17) History of Religion, Religions in India, Contemporary Hinduism

Assistant Professors
Yaakov S. Ariel (48) Judaism in America, American Evangelicalism and Premillennialism, Christian-Jewish Relationship

Adjunct Professors
Larry P. Churchill (27) Ethics, Philosophy of Religion
Philip Guza, New England Religious Literature
Paul W. Meyer, New Testament

Instructor
Lance Lazar (51) Medieval and Early Modern Religious Studies

Professors Emeriti
John W. Dixon Jr.
William J. Peck
John H. Schutz

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

105 MYTH, HISTORY, AND RELIGION (3). An analysis of these terms in their methodological and descriptive meaning in the study of religion. Spring. Staff.


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, Peck, Churchill.

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.

117, 118 ELEMENTARY AKKADIAN (3 each semester). Prerequisite, permission of the instructor. An introduction to the Cuneiform script and the elements of Akkadian grammar. Selected readings in Old Babylonian (Coden Hammurabi, Atrahasis Epic) and Neo-Assyrian texts (Epic of Creation, Gilgamesh Epic). (On demand.) Fall and spring. Sasson.

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.) Sasson.


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.) Van Seters.

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.


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.

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.

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. Maffly-Kipp, Tweed.

142 RELIGION AND ANTHROPOLOGY (Anthropology 142, Folklore 142) (3). Prerequisite, junior/senior or graduate standing. Religion, studied anthropologically, as a cultural, social, psychological phenomenon in the works of classical and contemporary social thought. Fall or spring. Tyson and Peacock.

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.

145 THE FIGURE OF THE FATHER IN RELIGION AND LITERATURE (WMST 145) (3). Prerequisite, permission of the instructor. The relationship between the figure of the father and the authority of the law (religious, societal, or familial) is studied through such writers as Flaubert, Kafka, and Freud. Spring. Masuzawa.

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.

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. 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.

159 PUBLIC RELIGION IN U.S. HISTORY (History 159) (3). Prerequisite, introductory History of Religious Studies course. A study of religion, collective action, and collective violence in United States history. Fall. (Alternate years.) Mathews.

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, Waghrone.

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 arts 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 Qur'an and the Prophet Muhammad, and its literary, cultural, and social development in Arab, Persian, 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. Faquirai.

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 ISLAMIC 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 FREUD AND NIETZSCHE ON RELIGION AND INTERPRETATION (3). Prerequisite, permission of the instructor. A close examination of selected works by Nietzsche and Freud and their critical impact on the contemporary analysis of literature and religion. Fall or spring. Masuzawa.

187 STUDIES IN THE RHETORIC 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.

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 religions and the social sciences. Fall or spring. Churchill.

192 CONTEMPORARY HINDUISM IN A GLOBAL CONTEXT (3). Seminar on changes in Hinduism in contemporary urban India and among the "dialects" that migrated to the United States and United Kingdom. Discussion of the transmission of Hinduism in this global context. Spring. Waghorne.

193 SPECIAL TOPICS IN MYSTICISM (3). Prerequisite, permission of the instructor. Historical and typological study of specific aspects of mystical and nonnormative 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. Fall. 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. Waghorne.

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 HISTOY (3). Prerequisite, graduate standing in Religious Studies or permission of the instructor. A historical and thematic survey of the religions of African Americans from the precolonial 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.


223 READINGS IN EARLY JEWISH AND CHRISTIAN APOCALYPTIC (3). Prerequisite, permission of the instructor. Readings from apocalyptic texts in the original languages. Spring. Halperin.

224 ARAMAIC/RABBINIC HEBREW (3). Prerequisites, Religious Studies 115-116 or permission of the instructor. Reading texts in rabbinic Hebrew, 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.) Van Seters.

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 languages. 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. Halperin.
244 HERMENEUTICS AND CRITICAL THEORIES: A HISTORICAL SURVEY (3). Prerequisite, graduate standing in Religious Studies or permission of the instructor. A historical survey of theories of criticism, aesthetics, and hermeneutics. Tyson and Peck.

245 THE CRITICAL LITERATURE IN RELIGION AND ART (3). Prerequisite, permission of the instructor. Critical methodology in religion and art via selected readings in theory of religion and art, texts on art in major religious traditions, and exemplary works in criticism of religion and art. Staff.

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. Masuzawa.

247 THEORIES OF RELIGION AND CULTURE (3). Prerequisite, permission of the instructor. Studies in early modern, enlightenment and romantic political, philosophical, and literary texts. Tyson.

248 READINGS IN AMERICAN RELIGION 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.


264 PROBLEMS IN RABBINIC HISTORIOGRAPHY (3). Prerequisite, Religious Studies 263 or permission of the instructor. Examination of the methodological problems of using rabbinic materials as sources for the history of Judaism in the period after 70 CE. Spring. Halperin.

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. Sasson.

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 illuminate significant aspects of the Catholic and Protestant Reformations are read in the original languages. Kaufman.

275 TEXTUAL CRITICISM OF THE GREEK BIBLE (3). Prerequisites, Greek and permission of the instructor. Reconstruction; application of text-critical principles. Spring. Ehman.

284 THEORIES OF RELIGIOUS EXPERIENCE (3). Prerequisite, graduate status. An investigation of problems in the psychology of religion posed by 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.

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. Halperin.

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. Van Seters, Sasson, Halperin, 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.

308 METHODS AND TOPICS IN THE STUDY 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 developments within traditions. Staff.

309 OTHERNESS AND HISTORY IN THE STUDY OF RELIGION (3). Prerequisite, permission of the instructor. An examination of the meaning of "other" in the methodologies of the study of religion as it has to do with the subjects of myth, history, ritual, and symbol in "other cultures" or in universal human experience. Staff.

310 SEMINAR IN RELIGION AND CULTURE (3). Prerequisite, permission of the instructor. Topics vary; consult department. Church, Peck, Tyson, Masuzawa.

311 SEMINAR IN RELIGION AND LITERATURE (3). Prerequisite, permission of the instructor. Topics vary. Masuzawa.

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.

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.

400 GENERAL REGISTRATION (0).

DEPARTMENT OF ROMANCE LANGUAGES
FRANK DOMÍNGUEZ, Chair

Professors

French
I. R. Stirling Haig (6) Nineteenth-Century French Literature
Catherine A. Maley (11) Romance Linguistics
C. Mallary 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. Rector (43) Portuguese Language and Literature

Spanish
Cesáreo Bandera (39) Medieval and Golden Age Spanish Literature, and Theory of Literature
Pablo Gil Casado (23) Contemporary Spanish Literature, Theory of the Novel
Angel L. Gilveri (41) Golden Age Literature and Intellectual History
Frank A. Domínguez (25) Medieval and Golden Age Literature, Ideology and Literature, Computer Applications in the Humanities
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 Sécule

Associate Professors
French
Martine Antle (45) Twentieth-Century French Literature
Yves de la Quèretrière (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
Marsha S. Collins (42) Modern Peninsular Literature
Audrey Heining-Boynton, Foreign Language Pedagogy, Curriculum Instruction
Rosa Perelmutter (37) Colonial Spanish American Literature, Contemporary Spanish American Narrative
José Manuel Polo de Bernabé (34) Nineteenth- and Twentieth-Century Spanish Drama and Poetry, Modern Critical Theory and Film
Alicia Rivero-Potter (38) Contemporary Spanish American Literature, Modern Critical Theory, Gender Issues, Literature and Science, Intellectual History

Assistant Professors
French
Sahar Amer (50) Medieval French Literature

Spanish
Alejandro Mejías-López (51) Nineteenth- and Twentieth-Century Spanish American Literature, Modernismo, Theory of the Narrative

Professors Emeriti
Julio Cortés
George B. Daniel
Alva V. Ebersole
Eugene H. Falk
Anthony G. Loré

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, Romansh, 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 Nadier 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 Flatow 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 “Resources” section in 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.

136 FRENCH STYLISTICS (3). Prerequisite, French 50. A theoretical and practical approach to the study of style. Spring. de la Quérière.

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. Antle, de la Quérière.

212 FRENCH POETS OF THE TWENTIETH CENTURY (3). A study of the poetry of Claudel, cubist poetry, 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. Antle, 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.) Antle, 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.


233 THEATRICALITY IN THE MIDDLE AGES (3). Theatrical approaches and techniques in medieval texts. Amer, Montgomery.

234 THE FRENCH CLASSICAL THEATRE (3). Readings in sixteenth- and seventeenth-century French theater, Crèbillon père, 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 nouvelle and lyric poetry from Machault through Villon. Spring. (Alternate years.) Montgomery.

261 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, officielle, libertine, and satirique. In addition to Desportes and Racan, works of Chassignet, Sponde, La Coupelle, Malherbe, Saint-Amand, Théophile 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 genres such as Prévoit, Lesage, Marivaux, La Calandril, 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 Mettrie, Condillac, Helvétius, d’Holbach, the Encyclopedists, and others. (On demand.) Sherman.
291 **THE FRENCH ROMANTIC NOVEL (3)**. A study of major novelists of French Romanticism (Balzac, Hugo, Sand, Stendhal). Fall. (Alternate years.) Haig.

292 **FRENCH ROMANTIC POETS (3)**. A study of the major poets of French Romanticism (Lamartine, Hugo, Vigny, Musset, and Nerval). Spring. (Alternate years.) Haig.

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.

294 **FRENCH NINETEENTH-CENTURY POST ROMANTIC POETRY (3)**. A study of the evolution of poetry and poetics in modernity beginning with Baudelaire. Fisher.

295 **THE FRENCH REALISTIC AND NATURALISTIC NOVEL (3)**. A study of major Realistic and Naturalistic novelists (Flaubert, the Goncourts, Daudet, Zola, Maupassant, and Huysmans). 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 Quérière, 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.

127 **PETRARCH AND LYRIC TRADITION (3)**. A reading of Petrarch’s Canzoniere within the context of previous lyric tradition and Petrarchism in Europe. Class discussion in English, readings in Italian for majors and in translation for non-majors. (Every third year.) Cervigni.

128 **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 Politian. 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: Machiavelli, Il Principe and at least one book of I Discorsi; Ariosto, Orlando Furioso; Tasso, Gerusalemme Liberata. Spring. (Alternate years.) Rao, Illiano.

171 **THE EIGHTEENTH CENTURY (3)**. Prerequisite, Italian 15 or 21. The literature of Arcadia, the Enlightenment, Vico, Goldoni, Parini, and Alfieri. Fall. (Every third year.) Illiano.

181 **ITALIAN ROMANTICISM (3)**. Prerequisite, Italian 15 or 21. Preromanticism; Alfieri; the lyrics and novels of Foscolo, Leopardi, Manonli; the Romantic drama from Foscolo to Niccolini. Spring. (Every third year.) Illiano.

182 **ITALIAN LITERATURE IN THE SECOND HALF OF THE NINETEENTH CENTURY (3)**. Prerequisite, Italian 51, 21, or equivalent. The major literary forms in the second half of the century with particular regard to Verismo, 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: Decadenti, Crepuscolari, Futuristi, 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 modern Italian criticism and to current methods of research and scholarship. Bibliographic survey of basic tools and secondary literature. Guidance to preparation 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 selected 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 nineteenth century. Fall. (Alternate years.) Clark.

104 SURVEY OF BRAZILIAN LITERATURE II (3). Prerequisites, Portuguese 4, 15, or equivalent. A survey 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 century with a review of the development of the theatre in Brazil. Fall. (Alternate years.) Clark.

Courses for Graduates


206 LUSO-BRAZILIAN BIBLIOGRAPHY AND METHODOLOGY (3). An introduction to bibliography and methodology in Luso-Brazilian literary and linguistic 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, novels, 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.) Staff.

291 PORTUGUESE OVERSEAS LANGUAGE AND LITERATURE (3). A survey 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.). Members of the graduate faculty.

393 MASTER'S THESIS (3). Members of the graduate faculty.

394 DOCTORAL DISSERTATION (3). Members of the graduate faculty.

ROMANCE

Courses for Graduates and Advanced Undergraduates

104 VIOLENCE AND RELIGION IN LITERATURE FROM EPIC TO NOVEL (CMPL 104, FWAD 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 (1.5). Introduction to theoretical issues of language learning with practical applications to the teaching of Romance Languages. (Required of all beginning teaching assistants in Romance Languages.) Fall. Jarausch/Cowell.

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 bookhands 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.

370 MINOR ROMANCE TONGUES (3). Introduction to historical development of Catalan, Rhaeto-Romance, and Rumanian. Readings in period texts. (Every third year.) Montgomery.

RUMANIAN
Courses for Graduates and Advanced Undergraduates

101 INTRODUCTION TO RUMANIAN (3). Introduction to the Rumanian language. Readings. (On demand.) Staff.

102 INTRODUCTION TO RUMANIAN: 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.

111 THE HISPANIC FILM: THEORY/CULTURE/LITERATURE (3). Prerequisite, Spanish 50 or equivalent or permission of the instructor. A study of Spanish and 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.

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, picareseque 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. Perelmuter.

126 HISTORY OF THE SPANISH LANGUAGE (LING 154) (3). Prerequisites, Spanish 71, 72, or 73. The formation of Castilian and other peninsular dialects and languages, beginning with Vulgar Latin and including Visigothic and Arabic influence. Expansion of the New World. Spring. Domínguez, Binotti.

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.

145 SPANISH PHONETICS AND PHONOLOGY (LING 155) (3). Prerequisite, Spanish 51 or equivalent. The study of sounds as system in American and peninsular Spanish. Attention to practical phonetics according to individual needs. Fall. King.

146 THE STRUCTURE OF MODERN SPANISH (LING 156) (3). Prerequisite, Spanish 50 or equivalent. Introduction to theories of grammar with a detailed analysis of the semantic and syntactic structure of contemporary Spanish. Attention also given to the application of linguistic theory to the teaching of Spanish. Fall. King.


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.) Perelmuter.

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, Pereda, 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, Mirl, 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, García Hontanans, Goytisolo, Benet, and others. Spring. (Alternate years.) Casado.

213 MEDIEVAL POETRY (3). Major poetic works from the Poema del Cid through Jorge Manrique. Fall. (Alternate years.) Bandera, Domínguez.

214 GOLDEN AGE POETRY (3). Major poetic works from Garcilasso through Quevedo. Fall. (Alternate years.) Bandera, Cilveti.

215 SPANISH POETRY AND DRAMA OF THE NINETEENTH AND EARLY TWENTIETH CENTURY (3). Study of Spanish dramatists and poets of the period in the 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). Fall. (Alternate years.) Binotti.

224 MEDIEVAL PROSE (3). Major prose works from Alonso X to the Celestina. Fall. (Alternate years.) Bandera, Domínguez.

225 GOLDEN AGE PROSE (3). The major prose works of the Golden Age, excluding those of Cervantes. Fall. (Alternate years.) Bandera, Cilveti.

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, Cilveti.

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 eighteenth century. Cilveti.

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. Cilveti.

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, Benet, 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. Perelmuter, Salgado.
114 MODERNIST AND CONTEMPORARY SPANISH AMERICAN LITERATURE (3). Prerequisites, Spanish 71, 73. Spring. Salgado, Perelmuter, Rivero-Potter.
120 THE IMAGE OF WOMAN IN SIXTEENTH-SEVENTEENTH CENTURIES (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. Perelmuter.

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.) Perelmuter.
241 SPANISH AMERICAN ESSAYS AND SHORT STORIES (3). Spring. (Alternate years.) Perelmuter, Rivero-Potter.
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. Perelmuter.
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, Carpenter, Rufo, 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-Potter.

335 SEMINAR IN SPANISH AMERICAN LITERATURE (3). Fall and/or spring. Staff.

ARABIC
Courses for Graduates and Advanced Undergraduates

101 ELEMENTARY ARABIC I (3). Fall. Amer.
102 ELEMENTARY ARABIC II (3). Spring. Amer.
141 READINGS IN ARABIC I (3). Classical and/or modern readings in Arabic, according to the students' interest and competence. Fall. Cortés.
142 READINGS IN ARABIC II (3). Classical and/or modern readings in Arabic, according to the students' interest and competence. Spring. Cortés.

Courses for Graduates

201 ROMANCE-ARABIC STUDIES I (3). Fall. Staff.
340 SPECIAL READINGS (Var.). Fall and spring. Cortés.

DEPARTMENT OF SLAVIC LANGUAGES AND LITERATURES

MADELINE G. LEVINE, Chair

Professors
Paul Debreczeny (2) Russian Literature and Comparative Literature
Madeline G. Levine (4) Russian and Polish Literature
Laura A. Janda (8) West Slavic Linguistics and Cognitive Linguistics

Associate Professors
Lawrence Feinberg (3) Slavic Linguistics, Poetics
Beth Holmgren (10) Russian and Polish Literature

Assistant Professors
Robert D. Greenberg (11) South Slavic Linguistics
Christopher Potney (12) Russian Literature, Medieval Slavic Culture
Ivana Vuletic (13) Serbian and Croatian Language and Literature, Russian Literature

Lecturer
Eleonora Magomedova, Russian Language

Professor Emeritus
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 either Russian literature or Slavic linguistics. All students are required to take Old Church Slavonic (SLAV 100) in the first year, to pass Fourth Year Conversation and Reading
(RUSS 112), and to write and defend a thesis. (Students who place out of RUSS 112 will be excused from the requirement.) In addition, the student must satisfy a language requirement (reading knowledge only) in either French or German.

1. The master's candidate in Russian literature is required to take the proseminar in Slavic literatures (SLAV 200), plus a minimum of a) one course in either medieval Russian literature or eighteenth-century Russian literature, and b) three courses to be distributed, with graduate adviser supervision, over the nineteenth and twentieth centuries. In addition to Old Church Slavonic (SLAV 100), the student must take one other course in Slavic linguistics and must register for three credits of SLAV 393 (thesis credits).

2. A student wishing to emphasize Slavic linguistics must take at least three courses in Slavic linguistics, including Old Church Slavonic (SLAV 100); two courses (one year) in a modern Slavic language other than Russian; and at least two courses in Russian or another Slavic literature. He or she must take at least one course outside the department in linguistics (normally Linguistics 101, Introduction to Historical and Comparative Linguistics, or Linguistics 120, Introduction to Descriptive Linguistics). The student may take one elective course (three hours) and must register for three credits of SLAV 393 (thesis credits).

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, Polish, or Serbian and Croatian literature, or in 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. Before taking their comprehensive examinations, all candidates for the Ph.D. must pass a qualifying examination in Russian language or receive a grade of P+ or better in Russian 207, Russian Stylistics.

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 at least once for three 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 POLISH LITERATURE (3). Introduction to Polish literature in English translation, focusing on nineteenth- and twentieth-century writers. Some readings in Polish for students who can use the language. Fall. Holmgren, Levine.

RUSSIAN


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.

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.

151 PUSHKIN (3). Study of major works. Fall. Debreceny.

152 LERMONTOV (3). A study of the major works of Lermontov. Staff.

162 RUSSIAN POETRY OF THE NINETEENTH CENTURY (3). Readings and lectures on nineteenth-century Russian poetry. Debreceny.

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. Debreceny, Levine.

165 CHEKHOV (3). Study of major works of Chekhov and a survey of contemporary authors and literary trends relevant to his career. Readings in Russian for majors, in English for nonmajors. Spring. Debreceny, Holmgren.

168 MASTERPIECES OF RUSSIAN LITERATURE AFTER 1917 (3). A study of outstanding works in Russian literature after 1917, including works by Blok, Zamytin, Sholokov, Pasternak, and Solzhenitsyn. Readings in Russian for majors, in English for nonmajors. Fall. 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. Debreceny, 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. Debreceny, Levine.

186 CONTEMPORARY RUSSIAN WOMEN'S WRITING (WMST 186) (3). A study of Russian women's writing after World War II, including both fictional and publicistic works analyzed in their sociopolitical context. Serves as an introduction to Russian women's studies. 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. Debreceny, 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. 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 syntactic explanations. For graduate students, exclusively in Russian. Equivalent to a full-year course. Summer. 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 Kievan 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. Debreceny.

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, Holmgren, 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, Axmatova, Mandel'shtam, Majakovskij, Khlebnikov, Pasternak, and Cvetaeva. Spring. Levine.


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
101, 102 ELEMENTARY SERBO-CROATIAN (3 each).
  Pronunciation, structure of the language, and reading in modern Serbo-
  Croatian. Fall and spring. Greenberg, Vuletic.

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. Vuletic.

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. Vuletic.

SLAVIC
100 OLD CHURCH SLAVONIC (3). An introduction to the lan-
  guage of the oldest Slavic texts. Translation, grammatical analysis, com-
  parison of texts. Feinberg, Greenberg, Janda.

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 lan-
  guage based on student interest: Albanian, Bulgarian, Macedonian,
  Romany, Turkish; also some adjacent languages: Georgian and Tadjik.
  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.

109 COGNITIVE LINGUISTICS (Linguistics 109) (3). Develop-
  ment of cognitive linguistics. Discussion topics: the bodily basis of meaning
  in language, categories and prototypes, construal language change. Readings
  drawn from linguistics, psychology, philosophy, artificial intelligence, and
  literary analysis of metaphor. Janda.

115 SLAVIC FOLK LITERATURE (Folklore 115) (3). Develop-
  ment of heroic songs. Folk tales and ballads in various Slavic areas and their
  influence on the development of written literature. Spring.

125 TOPICS IN SLAVIC LITERATURES (3). Material not
  presently covered in any course. The specific topic is announced in
  advance.

144H CHRISTIANIZATION OF THE SLAVS (3). Survey of the
  Christianization of Slavs from the ninth century to 1453. Themes include
  Byzantine missions, emergence of literary centers, and role of Balkans.
  Readings in English for non-Slavic concentrators. Putney.

165 LITERATURE OF ATROCITY (PWAD 165) (3). Literary rep-
  resentation - in fiction, poetry, memoirs, and other genres - of the mass
  annihilation and terror in Eastern Europe and the former Soviet Union
  under the Nazi and Communist regimes. Levine.

167 ETHNIC AND LINGUISTIC CONFLICTS IN THE FOR-
  MER YUGOSLAVIA (PWAD 167) (3). The role of linguistic contro-
  versies in the politicalization of ethnic relations in the former Yugoslavia.
  Topics: the Yugoslav idea, language and nationalism, ethnic tension, the
  unleashing of ethnic conflicts. Greenberg.

169 SLAVIC IMMIGRANT EXPERIENCE IN LITERATURE (3).
  Fictional and autobiographical expressions of the Slavic and East
  European immigrant experience in the twentieth century. Readings
  include Russian, Polish, Jewish, and Czech authors from early 1900s to
  the present. Holmgren, Levine.

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 lin-
  guistic 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 exami-
  nation of the linguistic history and contemporary dialectology of the West
  Slavic Languages (Polsih, Czech, Slovak, Upper and Lower Sorbian,

253 SOUTH SLAVIC LINGUISTICS (3). Prerequisites, Slavic 105
  and one year of study 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.

305 SEMINAR IN SLAVIC LINGUISTICS (3). Selected issues in
  Slavic synchronic and diachronic linguistics.

360 PRE-DISSERTATION RESEARCH (3). Staff.

393 MASTER'S THESIS (3 or more). Staff.

394 DOCTORAL DISSERTATION (3 or more). Staff.

400 GENERAL REGISTRATION (0).

SCHOOL OF SOCIAL WORK

RICHARD L. EDWARDS, Dean

Professors
Gary L. Bowen (98) Social Work with Families, Work and Family
Linkages, The Military Family, Research and Evaluation, Family
Values
Philip W. Cooke (5) Human Services Planning and Administration
Andrew W. Dobelstein (7) Local Political Systems, Aging, Social Welfare
Policy
Richard L. Edwards (218) Human Services Management, Social Policy
Mark W. Fraser (229) Children and Families at Risk; Substance Abuse
and Other Forms of Antisocial Behaviors, Research Training and
Scholarship
Maeda J. Galinsky (12) Social Group Work, Evaluation of Social
Intervention, Multicultural Practice

H. Carlisle Henley Jr. (18) Research Design and Questionnaire
Construction, Use of Computers in Social Work, Data Analysis,
Child Welfare
Gary M. Nelson (83) Social Gerontology, Policy and Planning, Program
Evaluation
Dennis K. Orthner (82) Research Methods, Organizations, Program
Evaluation, Families and Work, Families and Leisure
Charles L. Uther (227) Social Program Evaluation, Quantitative
Research Methods, Human Services Management
Marie O. Weil (95) Community Practice, Social Administration,
Community Development, Social Work and the Law, Services to
Families and Children
Associate Professors
Iris B. Carton-LaNey (239) Social Work History, especially African Americans and the Progressive Era, Rural Elderly African American Women and Social Support
S. Rachel Dedmon (38) Psychopathology, Mental Health Practice, Human Behavior
Anne-Linda Fustenberg (103) Aging, Health Behavior and Health Care, Qualitative Research Methods, Mental Health Services for Older People
Vanessa G. Hodges (241) Practice Research and Evaluation, Families and Children, Interventions with Families of Color, Social Support
Jack M. Richman (88) Individuals, Couples, and Family Practice, Social Support, Group Work
Kathleen A. Rounds (101) Health Behavior and Health Care, Program Evaluation

Adjunct Associate Professor
Kathryn N. Moss (246)

Clinical Associate Professors
Katherine M. Dunlap (32) Preschool Education, Empowerment of Parents and Parent Education, Home Health Care
Raymond S. Kirk (245) Human Services Administration, Child Welfare Services, Social Systems Research
Kelly Reath (107) Rural Health Services, Policy Implementation

Assistant Professor
M. Carleen Gilbert (91) Health, Mental Health, and Social Work Group Practice, Somatoform Disorders in Children, Qualitative Research Methods
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
Sheryl L. Zimmerman (295) Evaluation of Practice, Social Gerontology, Psychosocial Aspects of Health, Long-Term Care, Outcome Research, Methods for Studying Older Populations, Dementia, Hip Fracture

Adjunct Assistant Professor
Wayne R. Hadler (283)

Clinical Assistant Professors
George Cole (296)
Dean F. Duncan III (280) Program Evaluation, Management of Human Services Agencies, Research Methods
Dorothy N. Gamble (64) Community Organization, Community Development in a Cross-Cultural Perspective, Social Action
Evelyn S. Williams (105) Child Abuse Prevention, Domestic Violence, Cultural Competence, Staff Training
Jay C. Williams (265)
Laura I. Zimmerman (266) Human Services Computer Information Systems and Analysis, Defining Community Need and Strategic Planning
Irene N. Zipper (27) Early Intervention Services, Child Mental Health, Service Coordination/Case Management

Clinical Associate Professor
Florence G. Solosy (104) Social Gerontology, Ethics, End-of-Life Decisions, Interdisciplinary Clinical Assessment

Clinical Instructors
Lyndz Worth Bolton (294) Mental Health and Substance Abuse Services

Natalie Boorman (276) Multiple Family Group Therapy, Family Therapy
Susan G. Boyette (297)
Andrew Broughton (235) Use of Computers in Human Services, Program Evaluation, Total Quality Management
Jean Livermore Byassee (291) Children's Mental Health, Parenting Concerns, Learning and Attention Disorders in Children and Adults
Joanne S. Caye (260) Child Welfare, Public Welfare Administration
Lane Cooke (244) Family-Centered Services/Home-Based Services, Delivery Systems in Communities and Neighborhoods, Family Preservation Programs, Child Abuse/Neglect and Family Violence
Jodi Flick (298)
Mary E. Frase (251) Etiology and Treatment of Serious Mental Disorders, Mental Health Policy and Administration, Financing of Mental Health Services
Harriet Gailard (268) Health Care Accessibility for the Aged, Counseling for the Chronically Ill, Family and Children Services, Local Human Services Collaboration and Consolidation
Andrea Lyon (290) Mental Health, Substance Abuse, Family Issues, Gender Issues, Domestic Violence
Sherry Mergner (275) Substance Abuse and the Family, Cultural Diversity Issues, Women's Issues, Mind and Body Therapies, Spiritual Aspects of Healing
Margaret Morse (278) Computer-Based Training, Web Site Design
S. Yvette Murphy (271) Child Welfare, Supervision, Team Building
Myra J. Powell (272) Public Welfare Supervision/Management
Linda Ruhla (273) Aging, Death, and Dying: Developmental Disabilities, Family-Centered Practice, Adult Learning
Mary Anne P. Salmon (219) Aging, Demography, Manpower and Service Equity Issues
Anna Scheyett (222) Community-Based Services to Adults with Severe and Persistent Mental Illness, Mental Health Policy
Delores W. Shirley (243) Volunteer Support Services, Partnership Role Between Foster Parents and Biological Parents in Reunification Efforts and Kinship Care
Martha Waters (277) Cultural Diversity Training, Organizational Issues, Team Building
Judith White (279) Child Welfare Issues, Aging and Long-Term Care, Statistical Analysis
Gretchen Woolsey (262) Marriage and Family Therapy, Home Health Social Work

Lecturer
Amy D'Aprile (225) Families across the Lifespan, Social Work Education, Ethics
Daniel Lebold (299) Nonprofit Management, Fundraising, Multiculturalism, and Issues of Difference

Visiting Associate Professor
James H. Palmer (300)

Professors Emeriti
Arthur E. Fink
Albert L. Johnson
Albert W. King
Horstens K. McClinton
Morton L. Teicher
John B. Turner
Richard H. Uhlig

The M.S.W. Program
Students complete the foundation curriculum of twenty-six credit hours which provides 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 five concentrations in the advanced curriculum. Four of the concentrations, Services to the Aging and Their Families, Health and Medical Care Services, Mental Health Services, and Services to Families and Children, provide preparation for advanced practice in providing direct services to a particular population or social unit. The fifth concentration, Management, Planning, and Community Practice, provides preparation in advanced macro practice. As students develop individualized plans of study in consultation with their advisers, their course selection must be guided by the distributional requirements of the concentration they have selected. Students can, however, 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.

Part-time programs are offered in Chapel Hill, Asheville, and Charlotte, in which the first year of graduate professional education may be taken on a part-time basis over two successive academic years. Admission to these programs is granted on the same bases 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 both explanatory theory for understanding personal and social needs and 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 for purposes of testing and refining explanatory and/or practice theory.

A key feature of the program is its interdisciplinary structure. The curriculum combines core social work and social welfare courses and thorough training in research methodology and data analysis with a formal minor program in a related social or behavioral science. At the same time, students design their program of study around their special area(s) of interest.

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 that public welfare serves, and a description of the most important programs created by those policies.

102 INTRODUCTION TO RESEARCH METHODOLOGY (3). Introduces students to the overall scientific approach, from ethical issues and problem formulation through hypothesis, causality, research designs, conceptualization, operationalization measurement, data collection, and analysis.

103 HUMAN BEHAVIOR: A LIFE CYCLE PERSPECTIVE (3). Study of the life cycle from prenatal development through old age, examining the influences of biological, social, psychological, and cultural systems on human behavior and the implications for social service interventions.

106 RACISM: IMPLICATIONS FOR HUMAN SERVICES (3). This course's organizing 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.

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. Staff.

199 SCHOOL SOCIAL WORK POLICY/PRACTICE (3). 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 THE NATURE AND ETIOLOGY OF INSTITUTIONALIZED DISCRIMINATION (3). Examines the nature and etiology of institutionalized discrimination and its implications for social work while paying particular attention to issues relating to race and gender.

220 SOCIAL WORK PRACTICUM I (4). Students learn beginning practice skills through experimental opportunities and apply core knowledge to direct (individuals, families, groups) and indirect (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). The student applies specialized knowledge to social work practice at an advanced level with individuals, families, small groups, organizations, and/or communities in an agency of their 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). This course engages students in an exploration and validation of those processes, principles, and technologies involved in helping work groups, organizations, and communities.

225 SOCIAL WORK PRACTICE WITH INDIVIDUALS (3). This course provides the foundation for social work practice with individuals within the context of social welfare organizations. It emphasizes basic knowledge, analytic and practical skills, and values necessary for practice.

226 SOCIAL WORK PRACTICE WITH GROUPS (3). Prerequisite, SOWO 227. Course designed to enable 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.

230 ADULT MENTAL DISORDERS (3). Prerequisite, SOWO 103. Teaches students to identify major mental disorders resulting from biological, psychological, and social conditions, and promotes an understanding of the client's and family's experiences.

233 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.

234 CHILD MENTAL DISORDERS (3). Prerequisite, SOWO 103. Teaches students to identify mental disorders presenting in persons before age eighteen and resulting from biological, psychological, and social conditions and promotes understanding of the child's and family's experience.

236 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 on disadvantaged populations.

237 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.

238 SUSTAINABLE DEVELOPMENT (3) Course will examine perspectives and models of sustainable development. Students will analyze a project and present a participatory plan for engaging in sustainable development work.

239 ORGANIZATION 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, 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 service technique.

245 MENTAL HEALTH PRACTICE WITH ADULTS (3). Prerequisite or corequisite, SOWO 230. A seminar on clinical mental health social work with adults covering a range of interventions from case management and crisis intervention to long-term supportive therapy.

246 SOCIAL WORK PRACTICE WITH THE ELDERLY (3). Prerequisite or corequisite, SOWO 236. This course addresses social work practice with the 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 SOCIAL WORK PRACTICE IN HEALTH SETTINGS (3). Prerequisite or corequisite, SOWO 237. This course provides students with a knowledge base for practice in health settings. The context of practice, the issues and dilemmas, the multiple roles, and the psychosocial ramifications are examined.

248 MENTAL HEALTH PRACTICE WITH CHILDREN (3). Prerequisite or corequisite, SOWO 234. A seminar on clinical mental health social work with persons from birth to eighteen years, covering case management and crisis intervention, supportive therapy, and prevention.

249 NONPROFIT AND PUBLIC MANAGEMENT (3). Prerequisite, SOWO 239. Examines management and community problem-solving in complex political and economic environments, emphasizing social work values and technology.

250 COMMUNITY PRACTICE AND PLANNING (3) Course focuses on practice roles and skills in community development, planning, and organizing, modeling community practice. Students will provide peer training in their special interests.

251 CITIZEN PARTICIPATION AND VOLUNTEER INVOLVEMENT (3) Examines the role of grassroots organization in advocacy, self-help, and social development; the involvement of citizens in public planning; and the development of volunteer programs.

252 SUBSTANCE ABUSE AND DEPENDENCY (3). This course examines current theories/models of substance abuse and dependency. It explores clinical issues involved in direct practice with individuals, families, and diverse populations.

253 SOCIAL WORK PRACTICE WITH CHILDREN (3). Prerequisite or corequisite, SOWO 233. Develops the knowledge and skills required for effective assessment and intervention with children and youth experiencing stress. Environment, culture, family, coping styles, and developmental influences are examined.

254 FUNDRAISING FOR NONPROFIT ORGANIZATIONS (3). Addresses fundraising strategies for nonprofit organizations, including annual giving, major campaigns and special appeals, major gift cultivation and solicitation, proposal development, recruitment and management of fundraising volunteers.

255 ANTISOCIAL BEHAVIOR IN CHILDHOOD AND EARLY ADOLESCENCE: THEORY AND PRACTICE (3). Prerequisite, SOWO 227. This course explores theories and intervention methods related to practice with children who have antisocial, aggressive behavior. Emphasis is placed on using protective/risks factors to design multisystem service strategies.

263 MENTAL HEALTH POLICY (3). Prerequisite, SOWO 101. This course examines current policies affecting national and state mental health services. It examines historical trends, factors influencing policy, and strategies for policy change.

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 SOCIAL POLICY IN AGING (3). Prerequisite, SOWO 101. Students learn of social service, health, and income policy with the aged. Issues pertaining to informal support system and disadvantaged groups are explored in the context of aging policy.
HEALTH POLICY (3). Prerequisite, SOWO 101. Examines social, political, and economic factors related to health care policy. Emphasis is on how policies affect health status, access financing and service delivery; and social work practice in health care.

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.

SOCIAL WORK PRACTICE IN RURAL SETTINGS (3). Provides theory, knowledge, and skills for practice in rural communities. Examines epidemiological factors; cultural context; health, mental health, and public welfare delivery systems; and models of practice with different populations.

MID-MANAGEMENT PRACTICE FOR SOCIAL WORKERS (3). Administration and management of services through knowledge, skills, and a political perspective are examined. Issues such as restructuring and diversity are explored.

AFRICAN AMERICAN WOMEN'S HEALTH ISSUES (3). Explores selected health issues confronting African American women and identifies race, gender, age, and class variables which impact health.

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.

THE NATURE, DYNAMICS, AND TREATMENT OF FAMILY VIOLENCE (3). This course provides in-depth analysis of the etiology, effects, and dynamics of family violence as well as the identification of appropriate assessment and treatment strategies.

CARE OF THE DYING AND BEREAVED (3). This interdisciplinary 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.

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.

THE EVALUATION OF SOCIAL WORK PRACTICE (3). Prerequisite, SOWO 102. Students develop a knowledge of the purposes of evaluation research, the technology, and the methodology necessary to evaluate social work practice.

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.

Individual electives and independent study available for masters and doctoral students in any given semester:

INDIVIDUALIZED FIELD PRACTICUM (1-6). (Field fee $300).

SEMINAR IN HUMAN BEHAVIOR AND SOCIAL ENVIRONMENT (1-6).

SEMINAR IN DIRECT PRACTICE (1-6).

SEMINAR IN SPECIALIZED PRACTICE (1-6).

SEMINAR IN SOCIAL POLICY (1-6).

SEMINAR IN MACRO PRACTICE (1-6).

SPECIAL TOPICS IN SOCIAL WORK (1-6).

SPECIAL TOPICS IN HUMAN BEHAVIOR AND SOCIAL ENVIRONMENT (1-6).

SPECIAL TOPICS IN PRACTICE (1-6).

SPECIAL TOPICS IN POLICY (1-6).

SPECIAL TOPICS IN RESEARCH (1-6).

SPECIAL TOPICS IN FAMILY AND CHILDREN (1-6).

SPECIAL TOPICS IN HEALTH (1-6).

SPECIAL TOPICS IN MENTAL HEALTH (1-6).

SPECIAL TOPICS IN HUMAN SERVICES ADMINISTRATION (1-6).

SEMINAR IN RESEARCH (1-6).

GENERAL REGISTRATION (0).

PhD Courses

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. Fall. Weil.

RESEARCH METHODS IN SOCIAL INTERVENTION (3). Prerequisites, SOWO 102 and 202 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. Fall. Usher.


TEACHING SEMINAR (1). This seminar examines the role and structure of social work education at the BSW, MSW, and PhD levels, and emphasizes curriculum development, educational design, and instructional delivery. Spring. Richman.

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. Fall. Galinsky.

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. Spring. Bowen and Furstenberg.

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. Spring. Fraser, Mark.

RESEARCH PRACTICUM II (3). Continuation of Research Practicum I. (On request.) Rounds.

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. Fall, spring, summer. Richman.

DOCTORAL DISSERTATION (Var.). Dissertation work. (On request.)
DEPARTMENT OF SOCIOLOGY

ARNE L. KALLEBERG, Chair

Professors
Howard E. Aldrich (42) Formal Organizations, Race and Ethnic Relations, Inequality
Peter Bearman (50) Social Structure, Comparative and Historical, Social Networks
Judith Blau (5) Culture, Formal Organizations, Occupations and Professions
Peter M. Blau (7) Macrostructural Theory, Theory Construction, Comparative
Kenneth A. Bollen (47) International Development, Comparative Political Structure, Statistics
Barbara Entwisle (48) Demography, Methods, Family
Arne L. Kalleberg (49) Work, Organizations, Social Stratification
John D. Kasarda (32) Human Ecology, Urban Sociology, Public Policy
Sherry Kleinman (38) Social Psychology, Qualitative Research, Sociology of Emotions
Duncan MacRae Jr. (13) Public Policy Analysis, Applied Sociology
François Nielsen (43) Comparative and Historical, Methods, Sociobiology
Anthony Oberschall (39) Social Movements, Social Change, Development
John Shelton Reed (27) Regional, Survey Methods, Public Opinion
Ronald R. Rindfus (34) Demography, Family
Rachel A. Rosenfeld (40) Social Stratification, Education, Quantitative Methodology, Social Movements
Richard L. Simpson (18) Occupations, Work
Peter Uhlenberg (20) Demography, Family, Aging

Associate Professors
M. Richard Cramer (2) Race and Intergroup Relations, Social Psychology
Kathleen M. Harris (6) Demography, Family, Poverty, Public Policy
James A. Wiggins (22) Social Psychological Theory and Methods

Assistant Professors
Guang Guo (51) Social Statistics, Stratification, Demography
Rosa Haritos (55) Sociology of Science, Sociology of Mental Health, Sociology of Health
Lisa Keister (56) Formal Organizations, Work and Occupations, Stratification, Chinese Society
Charles Kurzman (57) Political Sociology, Social Movements, International Development, Comparative and Historical, Social Theory
Christian Smith (54) Sociology of Religion, Social Change in Latin America, Social Movements

Lecturer
Barbara Stenross (37) Sociology of Work, Sociology of Emotions

Joint Appointment
J. Richard Udry (19) Demography, Family

Adjunct Faculty
Craig Calhoun, Social Theory, Comparative and Historical, Political Gail Henderson, Social Medicine
James Johnson, Public Policy, Urban Sociology, Social Geography
John D. Stephens, Political Sociology, Political Economy, Comparative and Historical

Professors Emeriti
Amos H. Hawley
Henry A. Landsberger

Gerhard Lenski
Everett K. Wilson
Robert N. Wilson

The department 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 in brochures available from the department. 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 nonservice fellowships.

The department works closely with the Carolina Population Center, the Institute for Research in Social Science, and the University Computation Center. The institute maintains a Statistical Laboratory with modern processing equipment 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, Simpson, Nielsen, J. Blau.

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. Oberschall, Nielsen, Bearman.

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, Rosenfeld.

113 SOCIAL INEQUALITY ACROSS CULTURES (3). Prerequisites, Sociology 10 or Sociology 11. This course focuses on social inequality in human societies in different historical periods and geographical locations. Various forms of inequality, diversity, and hierarchy are considered. Fall, spring. Guo.
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. 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. Fall. Nielsen, Marks.

120 THE STATE AND SOCIETY (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 counter-revolution. 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. Reed, Cramer, Smith.

122 SOCIOLOGY OF HEALTH (3). A sociological analysis of (1) how the social processes affecting conditions of health and disease and (2) the cluster of social relationships and organizations that comprise the institution of medicine. Haritos.

123 EDUCATION AND STRATIFICATION (3). A study of theory and research on the educational institution, with emphasis on the multiple and changing effects of formal education in industrial societies. Staff.

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. Steinroth.


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.

128 SOCIOLOGY OF ART (3). Prerequisite, Sociology 10, 11, or 12, or permission of the instructor. The connections between art and larger society are examined, as well as the organizational and occupational worlds of artists. Approaches in the fine arts and social sciences are contrasted. 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.

140 SOCIALIZATION (3). Examines how persons become members of groups, communities, and organizations. Emphasis on general social psychological principles and concepts of socialization. Kleinman.

141 SOCIAL DEVIANCE (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, Oberschall, Wiggins.

145 SOCIOLOGY OF EMOTIONS (3). The course examines how emotions are organized within social groupings and institutions. Differences in socialization by gender, ethnicity, race, 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, Smith.

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.

158 COMPARATIVE MINORITY RELATIONS (3). A comparative analysis of dominant-minority group relations. Includes both cultural and racial minorities. Cramer, Nielsen.

160 CONTEMPORARY SOCIAL THEORY (3). Prerequisite, Sociology 50. Analysis of current problems in general social theory; action and structure, justice and equity, social change and reproduction. Contrast and evaluation of leading approaches to solutions. P. Blau, Bollen.

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 type 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. Haritos.

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.
Courses for Graduates

200 HISTORY OF SOCIAL THOUGHT (3). Prerequisite, graduate standing in sociology or written permission of the instructor. Historic social ideas of Western culture considered against a background of general cultural analysis in terms of systemic theory. Required of all graduate degree candidates in Sociology. Bearman, P. Blau.

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. P. Blau.

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 hypothetic-deductive model of theorizing is contrasted with other theoretical approaches. P. Blau.

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) hypothetic-deductive theorizing. A hypothetic-deductive macrostructural theory developed by the instructor is analyzed, and extensive empirical tests of the theory are presented. P. Blau.

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 pretested research proposal are required for all students. Entwisle.

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. Reed, Rosenfield, 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, multicollinearity, 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.

214 MARX AND MARXISM (2). Brief exposition and evaluation of Marx's theory of human nature, societal change and evolution, class, the state, family, and other institutions. Summary of dependency theory and critical theory. Staff.

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, Wiggins.

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, Nielsen.

220 INFLUENTIAL WORKS IN DEMOCRACY (Political Science 268) (3). The course covers the major traditions of democratic theory from ancient Greece to the present, ethno-political 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. Fall, spring. Stephens.

223 SOCIAL ATTITUDES (3). Basic theories and methods in attitude research with special attention to attitude dynamics and social relations. Reed.

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. Bearman, Elder, Kleinman.

230 SOCIAL STRATIFICATION (3). Prerequisite, Sociology 120 or equivalent. Analysis of major theories of social 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. Rosenfeld.

231 SOCIOLOGY OF GENDER (Women’s Studies 231) (3). Reviews of theories in sociology 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. Fall, spring. 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. Bearman, Nielsen, Oberschall, Smith.

237 METHODS FOR POLICY ANALYSIS AND EVALUATION (Political Science 237, Public Policy Analysis 237) (3). Prerequisite, Political Science 212, Planning 130, or equivalent. Introduction to selected techniques such as multiple regression, decision theory, research design, experiments, quasi-experiments, and program evaluation, as well as policy-related models. MacRae.

245 SOCIOLOGY OF ORGANIZATIONS (3). Prerequisite, permission of the instructor. A critical study of the theoretical and empirical analysis of organization behaviors. Organization theory and practice. Comparative analysis of structure, behavior, and change 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. Kalleberg.
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 and institutional frameworks of scientific work. Haritos.

248 MEDICAL SOCIOLOGY: HEALTH, ILLNESS, AND HEALING (3). This graduate seminar presents a conceptual and substantive overview of some of the most fundamental and salient 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. Haritos.

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 CLIENTS, CONSTITUENTS, AND THE PUBLIC (Var. 1-3). Prerequisite, permission of instructor. Public-sector organizations are considered in this course, along with clients and the public. The following issues are examined: efficiency, accountability, public goods, and advocacy. J. Blau.

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.

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 impact of urban areas 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.

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.) Kindt, Entwisle.

290 MORTALITY: SOCIAL DEMOGRAPHIC PERSPECTIVES (3). Prerequisite, Sociology 212 or equivalent, or permission of instructor. This advanced seminar covers mortality data and measurement, the inequality of death, trends in morbidity and mortality, and explanations of mortality decline. Social demographic perspectives receive primary emphasis. Fall, spring. Entwisle, Guo.

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规范, political, and behavioral 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. Beamman.

309 SEMINAR IN THE ANALYSIS OF SOCIALIST SOCIAL SYSTEMS (3). An analysis of special problems in the study of societies governed by a communist party. Stress is on major social institutions and on the course and sources of structural change. Staff.

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. Beamman.

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. Beamman.

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 209 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 DATA ANALYSIS (3). Prerequisite, Sociology 209 or equivalent. This course provides an introduction to statistical methods to analyze continuous and discrete dependent variables in longitudinal data sets. It examines panel data techniques, pooling cross-sectional and time-series data, and event history analysis. Fall. Bollen, Guo.

320 SYSTEMATIC METHODS OF QUALITATIVE RESEARCH (3). Course designed to teach methods of data collection and analysis for qualitative research. Kleinman.

321 FIELD RESEARCH (3 each semester). Registration by permission of the instructor.

326 SEMINAR IN SELECTED TOPICS (1-6). 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.
DIVISION OF SPEECH AND HEARING SCIENCES

JACKSON ROUSH, Director

Professor
David E. Yoder (47) Language, Augmentative Communication

Associate Professors
Elizabeth R. Crais (48) Language Development and Disorders in Infants, Toddlers, and Preschoolers; Working with Families in Early Intervention
Melody F. Harrison (40) Speech, Language, and Communication Development in the Hearing Impaired; Literacy
Jackson Roush (59) Pediatric Audiology, Early Intervention, Acoustic Immittance Measures

Assistant Professors
Katarina L. Haley, Speech Perception and Production Research, Voice Disorders, Adult Aphasia
Robert Mayo (49) Craniofacial Anomalies, Adult Language Disorders, Voice Disorders
James Montgomery (68) Language Disorders, Language/Learning Disabilities, Psycholinguistics

Research Professors
Robert W. Peters (9) Auditory and Speech Perception, Sensation and Perception, Stuttering
Joanne E. Roberts (50) Language Development and Disorders, Early Language Development, Otitis Media

Research Assistant Professors
John H. Grose, Audiology and Psychoacoustics Research
Margaret L. Sauer (65) Augmentative Communication, Clinical Supervision

Clinical Professor
Joseph W. Hall (53) Audiology and Psychoacoustics Research

Clinical Associate Professors
Celia R. Hooper (55) Voice Disorders and Prevention, Adult Language Disorders, Counseling Skills in Allied Health, Communication and Aging
Bobbie B. Lubker (51) Language Development, Epidemiology of Communication Disorders

Stanley J. Martinkosky (52) Alaryngeal Speech, Voice Disorders, Spasmodic Dysphonia
Linda R. Watson (67) Language Disorders in Young Children, Autism, Emerging Literacy

Clinical Assistant Professors
Connie Carlson-Smith, ENO, Hearing Aids, Hearing Assistive Devices, Practicum Coordination for Audiology
Carolyn M. Mayo, Multicultural Issues, Adult Language Disorders, Prevention of Communication Disorders
Sharon S. Ringwalt (42) Diagnostic Evaluations, Supervision, Ethics and Efficacy Issues
Brenda Robinson, Adult Neuropsych Disorders, Community Re-entry for Adults, Clinical Supervision

Clinical Instructor
Martha Mundy (70) Pediatric Audiology, Educational Audiology

Adjunct Associate Professors
Robert G. Paul (8) Clinical Audiology, Hearing Aids
Bruce A. Weber (64) Auditory Electrophysiology

Adjunct Assistant Professors
Mark M. Haythorn, Diagnostic Audiology

Adjunct Clinical Instructors
Christine P. Burkett, Neuromotor, Supervision
Virginia V. Clifford, Educational Speech Pathology, Supervision
Debra R. Reinhart, Augmentative Communication, Clinical Supervision

The Division of Speech and Hearing Sciences in the Department of Medical Allied Health Professions, School of Medicine, provides academic and professional education for speech-language pathologists and audiologists at the master's level. 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 master's curriculum: Audiology, Speech-Language Pathology, and Speech and Hearing Sciences. The program is 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 for the master's degree 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 Medical Allied Health Professions, School of Medicine.

Courses for Graduates and Advanced Undergraduates


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 criteria for the evaluation of research articles. Spring. Roush, Montgomery, Haley.

203 AUDIOLOGIC REHABILITATION FOR CHILDREN (3). Prerequisite, SPHS 123. Covers speech perception and the effects of hearing loss on perception and production of speech as background for understanding assessment and treatment. 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. Roush.

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 tools and intervention and planning for infants and toddlers with disability and their families. Spring. Crais.

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. Roberts.

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. Grose.

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 (3). Prerequisite, SPHS 112 or equivalent. Breakdown of processes in audition and their management. Fall. Haythorn.

241 NEUROANATOMY (3). Prerequisite, SPHS 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 birth through five and their families. Covers communication and related domains (e.g., play, cognition, social aspects). Fall. Crais.

264 LANGUAGE IMPAIRMENTS OF CHILDREN (3). Prerequisite, SPHS 263. Second part of two-course offering described in 263. Spring. Staff.

265 AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (3). Prerequisite, SPHS 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. Fall. Sturm.

281 APPLIED PSYCHOLINGUISTICS (3). Broad course in theoretical and applied psycholinguistics designed to examine underlying cognitive processes related to language 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. Ringwalt.

305 CLINICAL PRACTICUM OBSERVATION IN AUDIOL-OGY (1-3). Prerequisite, COM 104 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, SPHS 123 or equivalent. Clinical audiology techniques including speech audiometry and special auditory tests. Hearing 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, SPHS 310 or equivalent. Clinical audiology techniques including special auditory tests for pre- and postoperative evaluation in patients with the middle and inner ear. Emphasis is on management of the patient and the relationship between the audiologist and the physician. Spring. Staff.

312 CHARACTERISTICS OF AMPLIFICATION SYSTEMS (2). This course describes amplification options for the hearing-impaired: specifically, hearing aid, electroacoustics, and earmold technologies. Additionally, pre-hearing aid selection procedures are presented. Fall. Carlson-Smith.

313 FITTING AND DISPENSING OF AMPLIFICATION SYSTEMS (3). Prerequisite, SPHS 312 or equivalent. This course covers practical and theoretical approaches to fitting amplification systems and the procedures for dispensing amplification systems to the hearing-impaired. Spring. Staff.

314 ELECTROPHYSIOLOGIC AUDIOMETRY (3). Prerequisites, SPHS 221, SPHS 310. This course explores the field of electrophysiologic responses within the auditory and vestibular systems. Auditory brainstem response (ABR), electrocochleography (ECoG), electroencephalography (EEG), electromyography (EMG), and otoacoustic emissions (OAE) are covered. Spring. Weber.

315 ACOUSTIC SYSTEMS (3). Prerequisite, SPHS 123 or equivalent. Advanced principles of the acoustic systems. Auditory and industrial audiology and hearing conservation, including physiological and psychological factors. Fall. Roush.

316 INDUSTRIAL AUDIOLINGUISTICS AND HEARING CONSERVA-TION (2). Prerequisite, SPHS 123 or equivalent. Instructor approved.Military and industrial audiology and hearing conservation, including physiological and psychological factors. Fall. Roush.
317 PROFESSIONAL CONSIDERATIONS IN SPEECH AND HEARING (2). Prerequisite, SPHS 123 or equivalent. To provide the graduate major with information on establishment and operation of a professional practice. Attention to small business practices, accounting, business law, professional licensure, ethical guidelines, and other topics relevant to professional practice. Fall. Staff.

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.

341 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, SPHS 170 or equivalent. Discussion of adult aphasics, manifestation, diagnosis, prognosis, and therapy procedures. Combined lectures and laboratories. Spring. Haley.

343 PHONOLOGICAL DEVIATIONS: ASSESSMENT AND MANAGEMENT (3). Prerequisites, SPHS 130, SPHS 170. Course deals specifically with the most diagnostic tests of articulation and the specific management programs associated with each. Thorough examination of the research supporting each test and treatment plan is included. Fall. Crais.

344 ADULT MOTOR SPEECH DISORDERS (3). Prerequisites, SPHS 140, SPHS 170. Assessment and treatment of adults presenting with disorders of motor speech control (i.e., dysarthria, anarthria, and apraxia of speech). Fall. Mayo.

345 DIAGNOSTIC PRINCIPLES AND METHODS (3). Prerequisites, SPHS 140, SPHS 263, SPHS 170. Diagnostic tests and methods in speech and language pathology, including interview, counseling, and report-writing procedures. Fall. Harrison.

346 STUTTERING (3). Prerequisite, SPHS 170. Major theories, treatment, identification, and diagnosis with respect to child and adult stuttering. Summer. Mayo.

347 CHILD NEUROMOTOR SPEECH DISORDERS (3). Prerequisite, SPHS 170. Multidisciplinary approach to diagnosis and treatment of childhood neurologic or cranial disorders. Fall. Sturm.


349 EVALUATION AND CLINICAL MANAGEMENT OF PERSONS WITH ORAL-FACIAL ANOMALIES (3). Prerequisites, SPHS 140, SPHS 170. In-depth analysis 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, orthodontics, orthopedics, otolaryngology, and speech-language pathology. Spring. Mayo.

350 COMPUTER APPLICATIONS IN SPEECH AND HEARING SCIENCES (3). This course explores the use of computers in research and clinical practice for speech-language pathologists and audiologists. Summer. Roush.

352 COGNITIVE LINGUISTIC PROCESSING DISORDERS IN ADULTS (3). Prerequisite, SPHS 342 or equivalent. Discussion of normal aging and language. Assessment and treatment of cognitive and linguistic problems in persons with dementia, right hemisphere dysfunction, and traumatic brain injury. Spring. Haley, Hooper.

354 DYSPHAGIA (3). Prerequisite, SPHS 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. Staff.

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, SPHS 162 or equivalent. Course in normal and abnormal learning from a language perspective. Emphasis on evaluation and treatment from a neuro-psychoanalytical model. Summer. 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, SPHS 140. Practical experience in the use of instrumentation to assess the acoustic and physiologic characteristics of speech and voice production. Use of these instruments for therapeutic intervention. Spring. Hooper, Mayo.

393 MASTER’S THESIS (3 or more). Fall, spring, and summer. Staff.

DEPARTMENT OF STATISTICS

DOUGLAS G. KELLY, Chair

Professors
Robert J. Adler (2) Stochastic Processes, Random Fields
Edward Carlstein (25) Stochastic Processes, Nonparametric Inference
Indra M. Chakravarti (3) Design of Experiments, Combinatorics, Information and Coding Theory
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, Operations Research
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
Richard L. Smith (29) Extreme Value Theory, Time Series, Statistical Inference

Research Professor
Willem R. Van Zwet (28) Asymptotic Statistics, Statistical Inference, Probability

Associate Professors
Jianqing Fan (27) Nonparametric Functional Estimation, Statistical Inference
Chuanhu Ji (26) Inference for Random Fields, Time Series

Assistant Professor
Andrew Nobel (32) Nonparametric Statistics, Pattern Recognition
Adjunct Professors
A. Ronald Gallant (31) Econometrics, Nonlinear Models, Non-parametric Inference
Harry L. Hurd (33) Stochastic Processes, Statistical Inference
Barry Margolin (18) Design of Experiments, Categorical Data, Genetic Toxicology
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.

In addition to these basic courses, the department offers courses in statistical methods (105, 160, 200), stochastic models (180) and stochastic processes (129), time series analysis (133), and combinatorics (156, 158).

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 three 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. The typical first-year program is Statistics 105, 112, 129, 134 in the fall semester and 132, 133, 135, 150 in the spring. In the second and third years a student taking advanced courses may specialize in an area of interest. Five main areas of specialization are currently recognized: Inference, Design of Experiments, Multivariate Analysis, Probability and Stochastic Processes, and Statistical Communication Theory. 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 Phillips Hall, together with the departments of Mathematics and Physics. A departmental network of Sun Sparc stations provides the opportunity for advanced computing in a Unix environment. The Graduate Student Computer Labs have nine PCs and six Sun workstations. Through the UNC Office of Information Technology there is access to the campus mainframe, IBM 3090-170 computer; the VAX 6620 computer; a Convex C3840 midrange supercomputer; the North Carolina Supercomputing Center's CRAY Y-MPS/432 supercomputer located in the Research Triangle Park and accessed through the high speed North Carolina Research Education Network NC:REN; and the National Science Foundation supercomputers at the Pittsburgh Supercomputing Center and the Cornell National Supercomputer Facility. The Mathematics-Physics-Statistics Library, located in Phillips Hall, maintains an extensive collection of books and journals pertaining to statistics.

Short series of lectures on specific topics in statistics by distinguished authorities and visiting scholars are arranged on a regular basis, and a statistics colloquium meets on alternate weeks for the presentation of the latest research developments. In addition, the department's Center for Stochastic Processes funds a number of visiting scholars for longer lengths of time, and maintains an active research seminar series.

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. 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 text 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, which typically require no more than ten hours of service per week. Other awards include merit assistantships, University Graduate and Alumni Fellowships, George E. Nicholson Jr. Fellowships, Pogue 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 in the department’s separate catalog or on the Internet at www.stat.unc.edu. Requests for this publication and specific inquiries should be addressed to the director of Graduate Admissions, Department of Statistics.

Courses for Graduates and Advanced Undergraduates

101 STATISTICAL METHODS I (3). Prerequisite, integral calculus. Basic probability; descriptive statistics; introduction to statistical inference, including estimation, hypothesis testing, simple linear regression, nonparametric tests, contingency tables. Use of statistical computer packages. Fall and spring. Fan, Marron, Nobel.

102 STATISTICAL METHODS II (3). Prerequisite, Statistics 101. Linear regression, experimental designs; multivariate analysis; statistical computer packages. Spring. Chakravarthi.

104 SAMPLE SURVEY METHODOLOGY (Biostatistics 164) (3). Prerequisite, Statistics 101 or equivalent. Fundamental principles and methods associated with survey sampling, giving primary attention to nonmathematical 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. Kalbfleisch.

105 ELEMENTS OF STATISTICAL ANALYSIS (3). Prerequisite, permission of the instructor. Various topics in statistical methods, including applied regression analysis, analysis of simple experimental designs, data analysis, discrete multivariate data. Fall. Carlstein, Smith.

107 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.

111 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.


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, Simon.


133 INTRODUCTION TO TIME SERIES ANALYSIS (3). Prerequisite, Statistics 126. Topics chosen from time series data analysis. Fitting parametric models, such as regression-autoregression models, to time series. Spectrum analysis. Filtering. Spring. Adler, Leadbetter, Marron.

134 INTERMEDIATE STATISTICAL THEORY I (3). Prerequisite, two semesters of advanced calculus. Fundamentals of probability and distribution theory including axiomatic treatment of probability, independence, random variables, characteristic functions, convergence and approximation, common distributions. Fall. Fan, Simon.

135 INTERMEDIATE STATISTICAL THEORY II (3). Prerequisite, Statistics 134 or equivalent. Fundamentals of statistical inference including sufficient statistics, estimation, hypothesis testing, decision theory, various classical tests, Linear estimation; analysis of variance and regression are largely excluded (see Statistics 150). Spring. Fan, Simon.

140 LINEAR SYSTEMS (3). Prerequisite, 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. Leadbetter.


156 COMBINATORIAL MATHEMATICS (Mathematics 148) (3). Prerequisite, Math 81, or permission of the instructor. Recurrence relations and generating function; graphs and graph algorithms, principle of inclusion-exclusion. Fall. Brylawski.

160 APPLIED MULTIVARIATE ANALYSIS I (Biostatistics 166) (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. Summer. Muller.

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. Bandiwal.

180 STOCHASTIC MODELS (3). Prerequisite, Statistics 126. Introduction to queueing theory (substantial), Markovian sequential decision process, inventory theory and topics from stochastic linear programming, simulations, scheduling, game theory. Applications. Staff.


224 STATISTICAL LARGE SAMPLE THEORY (3). Prerequisites, Statistics 132, 135. Asymptotically efficient estimators; maximum likelihood estimators. Asymptotically optimal tests; likelihood ratio tests. Simons.


234 EXTREME VALUE THEORY (3). Prerequisites, Statistics 132 and 134. 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. Leadbetter.


236 STOCHASTIC ANALYSIS (3). Prerequisite, Statistics 112, 132, or permission of the instructor. Advanced course covering topics selected 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.


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.


260 ADVANCED STOCHASTIC METHODS OF OPERATIONS RESEARCH (3). Prerequisites, Statistics 132 and 180. Topics chosen from: renewal theory; queues with random arrivals; inequalities for queues; priority systems; theory of reservoirs; stochastic inventory problems. Staff.

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 adviser. Fall and spring. Staff.

394 DOCTORAL DISSERTATION (Var.). Prerequisite, permission of the student's adviser. Fall and spring. Staff.

400 GENERAL REGISTRATION.

CURRICULUM IN TOXICOLOGY

JAMES A. SWENBERG, Director

Professors
Thomas W. Bouldin (84) Neuropathology, Neurotoxicology
Kim Rowse Brouwer (77) Pharmacokinetics, Hepatic Uptake, Metabolism, and Excetration of Xenobiotics
Stephen G. Chaney (52) Molecular Biology, Platinum Anticancer Drugs
Channing J. Der, Ras Protein Superfamily, Signal Transduction and Oncogenes
Kenneth H. Dudley (14) Drug Metabolism, Stereoechemical Aspects of Biotransformation Reactions, Analytical Methods for Drugs and Metabolites
John T. Gartly Jr. (15) Physiology, Pharmacology, and Cell Toxicology, Lung Permeability
Avram Gold (29) Structure-Reactivity Relationships in Metabolism and Mutagenicity of Polycylic Aromatic Hydrocarbons
Barry Ger (16) Virus and Cancer Chemotherapy
Iris H. Hall (17) Hypolipidemic, Antifertility, Anti-inflammatory, and Antineoplastic Drugs
David G. Kaufman (20) DNA Replication, Chemical Carcinogenesis
Jean M. Luster (83) Developmental Neurobiology and Neuroanatomy, Neurotoxicology, Developmental Biology, Teratology
Steven A. Leadon (91) Molecular Genetics of Cellular Responses to DNA Damage
John J. Lemasters (70) Cell Biology of Hypoxic and Toxic Injury, Organ Preservation for Transplantation, and Digitized Video Microscopy
Richard B. Mallman (46) Neurotoxicology and Neuropharmacology of the Central Nervous System
Pierre Morell (86) Myelin Metabolism, Axonal Transport, Neurotoxicology
James A. Raleigh (85) Metabolism of Nitroheterocyclic Xenobiotics, Measurement of Normal and Tumor Tissue Hypoxia
Aziz Sancar, Molecular Biology, DNA Repair and Cancer, Structure and Function of DNA Repair Enzymes
Gary J. Smith (79) Molecular Toxicology, In Vitro Mutagenesis and Transformation
Kinuko I. Suzuki (88) Neuropathology, Genetic Neurological Disorders
James A. Swenemberg (89) DNA Adducts, Cell Proliferation
Ronald G. Thurman (26) Hepatotoxicity, Oxidative Stress, Organ Preservation
Bernard E. Weissman (90) Cancer Genetics, Tumor Suppressor Genes

Associate Professors
Louise M. Ball (76) Metabolism and Genotoxicity of Environmental Xenobiotics
Marila Cordeiro-Scott (62) DNA Replication in Eukaryotic Cells and Chemical Carcinogenesis
Curtis Harper (18) Biochemical Toxicology
David J. Holbrook Jr. (19) Biochemical Toxicology, Platinum Anticancer Drugs, Xenobiotic Metabolism
William K. Kaufmann (73) DNA Metabolism in Radiation and Chemical Carcinogenesis
A. Leslie Morrow, Neurotoxicology and Excitotoxicity of Alcohol
Gary M. Pollack (78) Pharmacokinetics and Pharmacodynamics of Therapeutic and Toxic Agents
Philip C. Smith (92) Toxicokinetics and Xenobiotic Metabolism, Peptide Analysis and Disposition
Jean-Michel Vos (87) DNA Replication, DNA Repair, Cancer Genetics, Carcinogenesis, Mutagenesis

Assistant Professor
William B. Coleman. Hepatocarcinogenesis, Tumor Suppressor Genes, Biology of Liver Stem Cells

Research Associate Professor
Milan J. Hazucha (30) Health Effects of Air Pollutants, Human Studies, Mechanisms of Response

Research Assistant Professors
Cindy P. Lawler (93) Behavioral Toxicology and Neurotoxicology
Leslie L. Devaude, Ethanol-Induced Alterations in GABA Receptor Function and Gene Expression, Neuroactive Steroids

Adjunct Professors
Linda S. Bumbaur (68) Chemical Disposition of Xenobiotics, Mechanistic Toxicology
John A. Cidlowski, Apoptosis, Steroids, Glucocorticoid Receptors, Hormone Action, Nucleuses, Gene Regulation
Gary E. R. Hook (48) Lung Biochemistry and General Toxicology
Joellen Lewtas, Carcinogenesis
George W. Lucier (41) Dioxin, Biologically Based Dose Response Models, Receptor Mechanisms, Risk Assessment
Edward J. Massaro (64) Cell Toxicology, Developmental Toxicology, Toxicology of Metals
Roger O. McClellan (91) Inhalation Toxicology
Paul Nettleshie (37) Pulmonary Function and Toxicology
Michael D. Waters (39) Bioassay Systems for Toxic Substances, Genetic Toxicology

Adjunct Associate Professors
James W. Allen (60) Mutagenesis, Carcinogenesis, Chromosome Damage
J. Carl Barrett (71) Cancer, Aging, Senescence, Apoptosis, Breast Cancer, Prostate Cancer
Thomas E. Eling (49) Prostaglandins, Carcinogenesis, Metabolism by Prostaglandins Synthetase
Henry d’A. Heck (57) Chemical Disposition, Pharmacokinetics, Chemical Carcinogenesis, Endocrine Toxicology
Jau-Shyong Hong (65) Neuropeptides and Neurotransmitters, Neurotoxicology, Neuropharmacology, and Neurochemistry
Ronald F. Mason (38) Free-Radical Intermediates in the Metabolism of Toxic Chemicals
Richard M. Philippet (80) Biochemistry of Drug Metabolism
Douglas E. Rickert (66) Xenobiotic Metabolism, Mechanisms of Toxicology
Ralph J. Smialowicz (92) Immunotoxicology
Raymond W. Tennant, Transgenic Animals in Carcinogenesis Studies
Hugh A. Tilson Jr. (61) Behavioral Toxicology, Developmental Neurotoxicology
Kenneth R. Tindall, Molecular Mutagenesis, Somatic Cell Mutation, Role of Mutagenesis in Carcinogenesis
Frank Welsch (59) Endocrine Reproductive and Developmental Toxicology

Adjunct Assistant Professors
Robert B. Devlin (94) Pulmonary Toxicology, Molecular Biology, Immunology, Human Studies and Environmental Pollutants
Thomas L. Goldsworthy, Proliferation, Apoptosis and Cell Cycle in Hepatocarcinogenesis
G. Jean Henry (95) Developmental Neurotoxicology, Molecular Neuroimmunotoxicology
Michael C. Madden, Arachidonic Acid Metabolism, Oxidative Lung Damage

Professor Emeritus
Tom S. Miyas, Pharmacodynamics, Biochemical Pharmacology and Toxicology

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. (1998 and 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. Course intended primarily for graduate students. Three lecture hours per week. Spring. Holbrook (course director).

Courses for Graduates
202 PRINCIPLES OF PHARMACOLOGY AND TOXICOLOGY (Pharmacology 202) (5). 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) (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).

209 BIOTRANSFORMATION OF XENOBIOTICS (Pharmacology
209) (2). Prerequisites, one course in general biochemistry, or
Pharmacology 202, and permission of the instructor. Recent advances in
the mechanisms by which drugs and other foreign chemicals are metabo-
лизed to active or inactive products. The importance of metabolic path-
ways to therapy/toxicity. Two lecture hours per week. Fall. Pharmacology
faculty: Harper, Dudley, Thurman.

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.

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 (course
directors).

221 TOXICOLOGY SEMINAR II (1). Student-conducted presenta-
tions and discussions of recent advances in toxicology; emphasis on criti-
cal 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 (course
directors).

222 TOXICOLOGY SEMINAR III (1). Student-conducted presenta-
tions reporting progress during the student's degree research. One hour
per week. Fall and spring. Toxicology faculty: Harper, Holbrook (course
directors).

260 TOXICOKINETICS (Pharmaceutics 260) (3). A quantitative
examination of the time course of absorption, distribution, metabolism,
excretion, and biologic effects of agents of toxicologic interest. Three lec-
ture hours per week. Fall. (1997 and alternate years.) Brouwer, Pollack
(course codirectors).

292 SEMINAR IN CARCINOGENESIS (Pathology 292) (2).
Prerequisite, permission of the course director. Survey of classical and cur-
rent 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. (1997 and alternate
years.) Pathology faculty: Coleman (course director).

301 RESEARCH IN TOXICOLOGY (3-9). May be repeated for
credit. Hours and credits to be arranged. Fall, spring, and summer.
Toxicology faculty.

391 MASTER'S THESIS (0-9). May be repeated. Hours and credits to
be arranged. Fall, spring, and summer. Toxicology faculty.

394 DOCTORAL DISSERTATION (0-9). May be repeated. Hours
and credits to be arranged. Fall, spring, and summer. Toxicology faculty.

400 GENERAL REGISTRATION (0).
The Graduate Faculty

PERMANENT FACULTY

James Ralph Abernathy, Ph.D., Professor of Biostatistics in the School of Public Health
Linda S. Adair, Ph.D., Associate Professor of Nutrition in the School of Public Health
Elie Maynard Adams, Ph.D., Kenan Professor of Philosophy, Emeritus
John Berry Adams, Ph.D., Professor of Journalism, Emeritus
Robert J. Adler, Ph.D., Professor of Statistics
Robert S. Adler, J.D., Professor of Business Administration
Dong-Hyun Ahn, Ph.D., Assistant Professor of Business Administration
Debashis Aikat, Ph.D., Assistant Professor of Journalism and Mass Communication
Michael T. Aitken, Ph.D., Associate Professor of Environmental Sciences and Engineering in the School of Public Health
John S. Akin, Ph.D., Professor of Economics
Edgar Hiestert Alden, Ph.D., Professor of Music, Emeritus
Howard E. Aldrich, Ph.D., Kenan Professor of Sociology and Adjunct Professor of Management in the School of Business
Virgil Charles Aldrich, Ph.D., Professor of Philosophy, Emeritus
James Elmore Allen, Ph.D., Associate Professor of Health Policy and Administration in the School of Public Health
Mary V. Allen, M.D., Assistant Professor of Pathology and Laboratory Medicine
Robert C. Allen, Ph.D., Professor of American Studies and Communication Studies
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Melinda A. Beck, Ph.D., Assistant Professor of Pediatrics in the School of Medicine and Nutrition in the School of Public Health
Mary Caroline Becker, M.D., Associate Professor of Epidemiology in the School of Public Health, Emerita
Richard Jay Beckman, M.A., Associate Professor of Journalism and Mass Communication
Patricia A. Bedinger, Ph.D., Assistant Professor of Biology
Frederick Otten Behrends, Ph.D., Professor of History, Emeritus
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Michael Caplow, D.D.S., Ph.D., Professor of Biochemistry and Biophysics
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Dino Cervigni, Ph.D., Professor of Italian and Comparative Literature
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Nancy Chaffee, D.D.S., M.S., Assistant Professor of Prosthodontics
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Stephen Gifford Chaney, Ph.D., Professor of Biochemistry and Biophysics, Toxicology, and Nutrition in the School of Public Health
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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 Asheville, 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.
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 Robert 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 mere 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 a nonresident for tuition purposes. A residence classification once assigned (and confirmed pursuant to any appellate process invoked) 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.

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 considered 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 and Prospective Students. Any student or prospective student in doubt concerning his or her residence status 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 vice versa, 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 the request within three weeks after the end of the term. If the student receives 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 a resident for tuition purposes after submitting falsified residency information or after knowingly witholding residency information, the student's application for in-state status is fraudulent. The institution may reexamine any application suspected of being fraudulent and, if warranted, will change the student's resident 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 which classification is sought, he or she must respond to the request within three weeks 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. 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 burden of all the evidence must produce a preponderance of evidence supporting the assertion of in-state status. Under the statute, proof of resident status is controlled initially by one of two evidentiary beginning points which are stated in terms of proba 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 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 registering. To overcome this prima facie showing of nonresidency, a person must produce evidence that he or she is a North Carolina domiciliary despite the parent's nonresident status.

b. Conversely, if the person's parents are domiciliaries of North Carolina under the law, 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 an admissions officer must be in writing and signed by the student and must be filed by the student with the officer within fifteen working days after the student receives notice of the decision classification. 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, H, and J 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, and M 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 his or her 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. These common law presumptions control even if the minor has lived in North Carolina for five years or more. 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, unless or 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.

2. 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 no later than the fall academic term next following completion of education prerequisite to admission at the institution.

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 special class of adulthood for purposes of. If the minor marries or obtains a judicial decree of emancipation under N.C. Gen. Stat. § 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 parent; 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 or in 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 clas-
sified 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

The information in this section comes from three sources: (1) North Carolina
General Statute 116-143.3, (2) A Manual to Assist the Public Higher Education
Institutions of North Carolina in the Matter of Student Residence Classification
for Tuition Purposes, revised September 1985, (3) Chancellor's Rules and Procedures
for Residence Classification of Students for Tuition Purposes and Determination of
Eligibility for the Special 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. § 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
her or his 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 appro-
priate 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 educa-
tion 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. residing 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 invol-
untarily 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 mem-
bers), a complete list of categories of persons who are considered "dependent rela-
tives" 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 deter-
mination. 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 Com-
mittee 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 deci-
sion. 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 those 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 intends to enroll and to officials of another school or school system in
which the student is simultaneously 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.

The University will release information from a student's education records to
other school officials (including teachers, officials and employees of UNC-CH or
other institutions in The University of North Carolina system 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 releases certain information that has been designated as "direc-
tory 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 address); student e-mail address; telephone listing (local and
grade/billing telephone numbers); date and place of birth; county, state and/or U.S.
territory from which the student originally enrolled; major field of study; class
(junior, senior, etc.); enrollment status (full-time, half-time, or part-time); anticipat-
ed 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 request how address information is printed in the
Campus Directory, or who wish to have all directory information restricted, must
notify the Office of the University Registrar, in writing, before the end of the fall or
spring registration period. A "Request for Non-Disclosure of Information" form,
available in 105 Hanes Hall, gives students certain options about release of infor-
mation on campus. The Office of the University Registrar will accept 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 Fall Registration period.

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 the Associate University Counsel (CB# 9150, 01 South Building). The text of the statute and regulations and the University's FERPA policy are also available for inspection in 01 South Building.

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 Governor 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, NC (mailing address P.O. Box 2688, Chapel Hill, NC 27515-2688; tel: 919-962-4588).

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.

FIREARMS AND OTHER WEAPONS

The possession of any gun, rifle, pistol, dynamite cartridge, bomb, grenade, mine, explosive, bowie knife, dirk, dagger, slingshot, leaded cane, switchblade knife, blackjack, metallic knuckles, or any other weapons of like kind 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 misdemeanor punishable by a fine not to exceed $500 and/or six months' 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. Students enrolled at UNC-Chapel Hill on July 1, 1986 are exempt from this requirement.

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.

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.
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 thereby 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 catalogs 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 proceedings 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 Guide (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, pethedrinal, 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 three days, 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 program; 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:
Generally persons twenty-one or older may purchase or consume alcoholic beverages and may possess alcoholic beverages at their homes or temporary residences.
It is against the law for any person under twenty-one to purchase or possess any alcoholic beverage.
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.
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 also be found in the Campus Security Policies notebook on reserve at the Undergraduate, Law, and Health Sciences libraries, and can be accessed on the World Wide Web at the following address: www.unc.edu/student/policies/alcohol.html.

Under the policy, Alcohol may not be sold or consumed in any University building or open space except as provided in the University's Guidelines for Soring Alcohol at University-Sponsored Events.

Alcohol may not be possessed or consumed at any campus event or at any performance on campus, and alcohol may not be consumed at any outdoor campus location.

Common source containers of alcohol (e.g., kegs) are not permitted on campus.

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.

No Student Activity Fees or other University-collected fees may be used to purchase alcohol.

No other funds of an officially recognized student group deposited or administered through the Student Activities Fund Office may be used to purchase alcohol.

Student groups are not prohibited from having events off campus at which individual group members aged twenty-one or older bring 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 Committee on Problem Admissions and Extraordinary Disciplinary Emergencies, and/or state and federal authorities.

MASTER'S/DOCTORAL DISSERTATION

Receipt of an approved master's thesis or doctor 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.
MINORITY PRESENCE GRANT PROGRAM - GENERAL PROGRAM

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.

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.
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