DEPARTMENT OF GEOGRAPHY AND ENVIRONMENT (GRAD)

The graduate program of the Department of Geography and Environment aims to produce leading scholars and practitioners who will make vital contributions to contemporary geographical, social, and environmental knowledge, research, teaching, and institutions. The department approaches this goal by creating an environment in which exceptional Ph.D. and M.A. students can draw on the strengths of faculty and research centers to develop and sharpen their own research interests, capabilities, and programs around critical geographical problems. The graduate curriculum is designed to promote a broad sense of the geographical tradition in its evolving relationship with other sciences, social sciences, and humanities disciplines, and to provide a disciplinary and interdisciplinary platform for more specialized scientific and scholarly investigation.

The program offers opportunities for graduate students with diverse backgrounds and goals to receive training in varied and integrated aspects of the discipline and to work directly with faculty members on specific research projects. Master's and doctoral degrees are offered, but the programmatic focus is on the doctoral degree. As much as possible, all programs are tailored to the needs and interests of the individual student. The student's academic advisor and committee members have prime responsibility for developing, with the student, an appropriate course sequence and research program and for providing mentoring of the student. The program aims to foster maximum flexibility for individuals while ensuring a uniformly high standard of geographical training for all graduate students. Graduate students work closely with research centers and programs related to their interests, including the Carolina Population Center, the Odum Institute for Research in Social Science, the Institute for the Study of the Americas (UNC-Chapel Hill and Duke University), the Center for the Study of the American South, the Carolina Center for the Study of the Middle East and Muslim Civilizations, the Southeast Regional Climate Center, the Sheps Center for Health Services Research, the Ecology, Environment, and Energy Program, the Center for Urban and Regional Studies, the Institute for the Environment, and UNC–Chapel Hill's schools of public health and medicine. Up-to-date lists of geography faculty members and courses, along with additional information about the graduate program, faculty research projects, and other information, are available on the department's website (http://geography.unc.edu). Students build strong research, teaching, and professional skills with emphases on data analysis, project design and management, and oral and written communication that prepare them for careers at universities and in the public and private sectors.

A large proportion of graduate students receive financial assistance. Sources of aid include teaching assistantships and work on sponsored research projects within the department, University-wide competitive assistantships, nonservice fellowships, merit scholarships, and externally awarded fellowships.

The department occupies the top two floors of Carolina Hall and has access to extensive computational laboratories needed to fulfill its research and teaching mission, with specialized facilities dedicated to spatial analysis and the use of geographic information systems. A range of geographic data sets is readily available. An extensive collection of geographic books and periodicals, including an exceptionally strong collection of foreign periodicals, is held in the nearby Davis Library, while Wilson Library houses a large map collection.

The Department of Geography and Environment offers advanced programs leading to the master of arts and doctor of philosophy degrees. While both the M.A. and Ph.D. degrees are offered, the major emphasis of the program is on the Ph.D., even for those not yet possessing an M.A. Incoming students are roughly evenly mixed between those with and without a master's degree.

All graduate students are required to complete three core courses (GEOG 702, GEOG 703, and GEOG 704) presenting the foundations of geographical theory, communication, and research. Thereafter, the program of study is flexible and tailored to the needs of the individual student. Students select the appropriate coursework and dissertation topic in consultation with their advisor and dissertation/thesis committee.

The Department of Geography and Environment has faculty strength in five overlapping areas of concentration. These represent coherent foci and areas of active faculty research, not mutually exclusive categories. Indeed, many students and faculty members work on projects that span more than one area. So, while intensive training is offered in a number of diverse areas, the program is noted for its integrative and cross-cutting approaches. The department's diverse graduate students are pursuing a wide variety of research at UNC–Chapel Hill.

Departmental research specializations include

Biophysical Geography and Earth Systems Science. UNC–Chapel Hill geographers examine the biophysical environment as an integrated system, emphasizing the linkages and feedbacks between terrestrial and atmospheric form and function. The focus is on the interactions between the structure and composition of the earth's surface, its soils and vegetation, and the atmosphere with those processes that actively cycle energy and material through them.

Culture, Society, and Space. UNC–Chapel Hill geographers investigate the intersection of space, place, landscape, and region with social and cultural processes, including issues of identity and representation, spatio-temporalities of social belonging and exclusion, and the production and circulation of value and values. This work encompasses a diversity of methodological approaches, scales, and concerns, from urban dynamics and symbolic spaces to rural landscapes, agrarian and industrial change, and social geographies of race, class, gender, health, and religion.

Geographic Information and Analysis. UNC–Chapel Hill geographers apply geographic information sciences as an integrated set of spatial digital technologies to investigate biophysical and social phenomena. They use and develop tools, techniques, concepts, and data sets associated with geographic information systems, remote sensing, data visualization, global positioning systems, spatial analysis, and quantitative methods.

Globalization and International Development. UNC–Chapel Hill geographers study the consequences of processes of globalization (and the anti-globalization and global justice movements they stimulate); international development and its effects on the geographies of international and local capital, labor, technology, information, goods and services; postsocialism, political economy, political geography and geopolitics, and political ecology.

Nature-Society Studies and Human-Environment Interactions. Drawing on analytical and theoretical perspectives from ecology, socioecological systems, political ecology, science studies, and cultural studies, UNC–Chapel Hill geographers investigate the social contexts, drivers, and

consequences of environmental change and struggles over land use and resources.

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.

Professors

Shorna Allred (52), Environmental Justice, Conservation Social Science, Conservation and Land-Use Decision-Making, Global Sustainability, Community Resilience, Southeast Asia and U.S. South
Michael Emch (29), Medical Geography, Spatial Epidemiology, Health and Environment, Geographic Information Systems (GIS), Remote Sensing
Banu Gökariksel (28), Urban, Cultural, and Feminist Geography; Social Theory; Globalization and Modernity; the Middle East and Southeast Asia
Clark Gray (35), Population, Environment and Development; Survey and Statistical Methods
Elizabeth Havice (36), Political Economy and Ecology, International Development, Commodity Studies, Environmental Politics, Trade Politics, Fisheries Systems
Scott L. Kirsch (23), Historical, Cultural, and Political Geography; Science and Technology Studies
Charles E. Konrad (16), Synoptic Climatology and Meteorology
Elizabeth Olson (41), Critical Health Geography, Care Ethics, Child and Youth Geography, Inequality
Diego Riveros-Iregui (42), Ecohydrology, Watershed Hydrology, Biogeochemistry, Land-Atmosphere Interactions, Tropical Hydrology, Climate and Land Use Cover Change
Sara Smith (33), Political and Social Geography, Nationalism, Health, South Asia
Conghe Song (24), Remote Sensing of Environment, Forestry and Forest Ecosystem Services, Modelling, Dynamics of the Integrated-Social and Environmental Systems
Gabriela Valdivia (32), Political Ecology and Resource Geography, Extractive Economies, Indigenous Communities, Latin America
Erika Wise (34), Dendrochronology, Climatology, Water Resources

Associate Professors

Javier Arce-Nazario (43), Landscape History, GIS-Remote Sensing, Translational Geoscience, Critical Physical Geography, Water and Sustainability
Paul L. Delamater (44), Health and Medical Geography, Access to Healthcare Policy, Spatial Analysis, GIS
Christian Lentz (39), Development, State Formation, Nationalism, Nature-Society Relations, Agrarian Studies, Southeast Asia
Nina Martin (31), Urban, Economic, and Migration Geography; Globalization and Urban Change; Urban Planning and Policy; Civil Society
Aaron Moody (18), Geographic Information Systems (GIS), Biogeography
Chérie Rivers (47), Black Geographies, Decolonial Praxes, Indigeneity and Sustainable Farming, Black Atlantic World

Assistant Professors

Amanda Gay DelVecchia (49), Freshwater Ecology, Biogeochemistry, Watershed Science, Groundwater – Surface Water Exchange
Maliheh Ghajargar (56), Human-Environment Interaction, Sustainability, and Human-AI Creative Interaction
Ruth Matamoreos-Mercado (50), Land, Critical Indigenous Geographies, Moskitia, and Central America
Danielle Purifoy (48), Black Geographies, Environmental Justice, Uneven Development, U.S. South
Paul Taillie (50), Wildlife Conservation, Vertebrate Community Ecology, Global Change, and Remote Sensing

Teaching-Track Faculty

Jun Liang, Teaching Associate Professor
Adrian Drummond-Cole, Teaching Assistant Professor
David Parr, Teaching Assistant Professor
Julia Cardwell, Teaching Assistant Professor

Research-Track Faculty

John Pickles, Research Professor
Stephan Walsh, Research Professor
Richar Bilsborrow, Research Professor
Christopher Fuhrmann, Research Associate Professor and Deputy Director, Southeastern Regional Climate Center
Qi Zhang, Research Assistant Professor
Chao Wang, Research Assistant Professor

Adjunct Faculty

Lawrence Band (University of Virginia) Watershed Hydrology, Ecology & Geomorphology, GIS, Remote Sensing
Angel Hsu (Department of Public Policy), Data Science, Environmental Justice, Urban Heat Island, Climate Change
Pamela Jagger (University of Michigan), Energy, Livelihoods, Poverty, Forest Economics and Policy, and Human-Environment Interactions
Carlos Mena (Universidad San Francisco de Quito, Ecuador), GIS, Latin America, Population and Environment, Remote Sensing, Dynamic Modeling
Dinesh Paudel (Appalachian State University), Sustainability, Community Forestry, Development, Disaster Recovery and Resilience
Tamlin Pavelsky (Department of Earth, Environment, and Marine Sciences), Hydrology, Remote Sensing, Climate Change
Diego Quiroga (Universidad San Francisco de Quito, Ecuador), Environmental Life and Sciences
Elizabeth Shapiro (Duke University), Market-Based Environmental Initiatives and Policies in Latin America
Andres Vina (Michigan State University), Environmental Change, Biophysical Properties of Vegetation, Human-Environment Interactions
Colin West (Department of Anthropology), Human Ecology, Households, Global Change, West Africa, GIS, Remote Sensing, Agent-Based Modeling

Professors Emeriti

Stephen S. Birdsall
John W. Florin
Wilbert M. Gesler
Richard J. Kopec
Thomas M. Whitmore

GEOG

Advanced Undergraduate and Graduate-level Courses

GEOG 406. Atmospheric Processes II. 4 Credits.
Principles of analysis of the atmosphere are applied to the analysis of environmental phenomena. The link between the atmosphere and other environmental compartments is explored through environmental case studies.

Rules & Requirements
Grading Status: Letter grade.
Same as: ENEC 406.

GEOG 410. Modeling of Environmental Systems. 3 Credits.
Uses systems theory and computer models to understand ecosystem energy and matter flows, such as energy flow in food webs, terrestrial ecosystem evapotranspiration and productivity, related to climate, vegetation, soils, and hydrology across a range of spatial and temporal scales.

Rules & Requirements

IDEAs in Action Gen Ed: FC-NATSCI or FC-QUANT.
Grading Status: Letter grade.

GEOG 412. Synoptic Meteorology. 3 Credits.
An analysis of synoptic weather patterns and the processes responsible for them. Climatological aspects of these weather patterns are emphasized. (EES)

Rules & Requirements
Requisites: Prerequisite, GEOG 110 or 111.
Grading Status: Letter grade.

GEOG 414. Climate Change. 3 Credits.
An investigation of the scientific basis of climate change (past, present, and future), the current state of knowledge concerning future projections, and the implications of climate change for society and the environment.

Rules & Requirements

IDEAs in Action Gen Ed: FC-NATSCI, RESEARCH.
Requisites: Prerequisite, At least ONE of the following: GEOG 110, GEOG 111, EMES 201, ENEC 201.
Grading Status: Letter grade.

GEOG 415. Communicating Important Ideas. 3 Credits.
This hands-on course will set you on a path towards making a positive difference in the world through effective communication of ideas that are important to you. Emphasis will be on practical skills in listening, clarifying your message, having a narrative focus, creating effective graphics, giving engaging oral and poster presentations, social media use, communication with journalists, operating in the judicial and political arenas, and community outreach and public talks.

Rules & Requirements

IDEAs in Action Gen Ed: COMMBEYOND.
Grading Status: Letter grade.

GEOG 416. Applied Climatology: The Impacts of Climate and Weather on Environmental and Social Systems. 3 Credits.
Applied climatology involves the interdisciplinary application of climate data and techniques to solve a wide range of societal and environmental problems. This projects-based course investigates how climate impacts a range of sectors, including water resources, urban environments, ecosystems, and human health.

Rules & Requirements

IDEAs in Action Gen Ed: FC-NATSCI, RESEARCH, COMMBEYOND.
Grading Status: Letter grade.

GEOG 419. Field Methods in Physical Geography. 3 Credits.
Involves evaluation of landscapes by examining nature and biophysical elements influencing landscape form and function. Course emphasizes data collection, analysis, and interpretation using GIS and field methods. (EES)

Rules & Requirements
Grading Status: Letter grade.

GEOG 423. Social Geography. 3 Credits.
A study of the spatial components of current social problems, such as poverty, race relations, environmental deterioration and pollution, and crime. (GHA)

Rules & Requirements
Grading Status: Letter grade.

GEOG 424. Geographies of Religion. 3 Credits.
This course considers the theoretical and empirical dimensions of religion from a geographical perspective. The course introduces the key theories linking space, place, and religion and helps students apply these new theoretical tools to examine some of the pressing issues in the contemporary study of religion.

Rules & Requirements

IDEAs in Action Gen Ed: FC-KNOWING.
Grading Status: Letter grade.

GEOG 428. Global Cities: Space, Power, and Identity in the Built Environment. 3 Credits.
This course addresses questions of power, politics, and identity in the urban environment, with a focus on the emergence of key selected global cities and the processes that both created them historically and which are currently transforming them locally and globally.

Rules & Requirements

IDEAs in Action Gen Ed: FC-GLOBAL or FC-VALUES, RESEARCH.
Repeat Rules: May be repeated for credit. 6 total credits. 2 total completions.
Grading Status: Letter grade.
Same as: PLAN 428.

GEOG 429. Urban Political Geography: Durham, NC. 3 Credits.
An interdisciplinary exploration of urban social problems, bridging the literature on urban geography with that on urban politics. Students will be required to complete 30 hours of service for an organization that works on an urban social issue.

Rules & Requirements

IDEAs in Action Gen Ed: FC-POWER or FC-VALUES, RESEARCH, HI-SERVICE.
Grading Status: Letter grade.

GEOG 430. Global Migrations, Local Impacts: Urbanization and Migration in the United States. 3 Credits.
This course explores the relationship between patterns of urban development in the United States and migration, in both historical and contemporary contexts.

Rules & Requirements
Grading Status: Letter grade.

GEOG 435. Global Environmental Justice. 3 Credits.
This advanced course brings geographical perspectives on place, space, scale, and environmental change to the study of environmental justice. In lectures, texts, and research projects, students examine environmental concerns as they intersect with racial, economic and political differences. Topics include environmental policy processes, environmental justice movements, environmental health risks, conservation, urban environments, and the role of science in environmental politics and justice. (GHA)

Rules & Requirements

IDEAs in Action Gen Ed: FC-GLOBAL or FC-POWER, RESEARCH.
Grading Status: Letter grade.

GEOG 436. Governance, Institutions, and Global Environmental Change. 3 Credits.
Interdisciplinary course for advanced undergraduates and graduate students. Focuses on multiscale environmental issues and related social, institutional, governance, and policy challenges. Examines key concepts and theories involving global environmental change and problem-solving efforts.

Rules & Requirements
Grading Status: Letter grade.

GEOG 437. Social Vulnerability to Climate Change. 3 Credits.
How does climate change affect vulnerable human populations? We will attempt to answer a shared research question on this topic by reading the peer-reviewed literature and by conducting a semester-long data analysis project incorporating social and climate data from around the world. This is a course-based undergraduate research experience (CURE).

Rules & Requirements

IDEAs in Action Gen Ed: FC-GLOBAL, RESEARCH.
Grading Status: Letter grade.
Same as: ENEC 437.

GEOG 440. Earth Surface Processes. 3 Credits.
This course will focus on the processes of soil formation, erosion, and landform evolution with an emphasis on the interaction of geomorphic processes with surface hydrology and ecosystems. (EES) Course previously offered as GEOL 502.

Rules & Requirements
Requisites: Prerequisite, GEOG 110.
Grading Status: Letter grade.
Same as: EMES 502.

GEOG 441. Introduction to Watershed Systems. 3 Credits.
Introduction to hydrologic and geomorphic processes in watersheds as applied to problems in flood analysis, water quality, and interactions of hydrology and environmental sciences. Drainage networks, nested catchments, and distribution and controls of precipitation, evaporation, runoff, and groundwater flow. Includes local field trips. (EES)

Rules & Requirements
Requisites: Prerequisite, ENEC 202 or GEOG 110; permission of the instructor for students lacking the prerequisite.
Grading Status: Letter grade.

GEOG 442. River Processes. 3 Credits.
Introduction to landforms and processes associated with flowing water at the earth's surface. Hydrology, sedimentology, and theories of channel formation and drainage basin evolution. (ESS)

Rules & Requirements
Grading Status: Letter grade.

GEOG 444. Landscape Biogeography. 3 Credits.
This course is concerned with the application of biogeographical principles and techniques to the study of natural and human-modified landscapes. It includes local and extraregional case studies. (EES)

Rules & Requirements
Grading Status: Letter grade.

GEOG 446. Geography of Health Care Delivery. 3 Credits.
This course examines the role that geography plays in shaping how people interact with the health care system. Topics include health care delivery system types, facility and personnel distributions, access to care, health care utilization, as well as GIS, spatial analysis, and decision support systems.

Rules & Requirements
Grading Status: Letter grade.

GEOG 447. Gender, Space, and Place in the Middle East. 3 Credits.
Examines gender, space, and place relationships in the modern Middle East. Investigates shifting gender geographies of colonialism, nationalism, modernization, and globalization in this region. (GHA)

Rules & Requirements
Grading Status: Letter grade.
Same as: ASIA 447, WGST 447.

GEOG 448. Transnational Geographies of Muslim Societies. 3 Credits.
Examines modern Muslim geographies that are created by transnational flows, connections, and imaginaries that cross national and regional boundaries across the Middle East, Southeast Asia, and beyond.

Rules & Requirements
Grading Status: Letter grade.

GEOG 451. Population, Development, and the Environment. 3 Credits.
Introduction to contemporary and historical changes in human population, international development, and the global environment and how these processes interact, drawing on population geography as an organizing framework. Previously offered as GEOG 450.

Rules & Requirements

IDEAs in Action Gen Ed: FC-GLOBAL.
Grading Status: Letter grade.
Same as: ENEC 451.

GEOG 452. Mobile Geographies: The Political Economy of Migration. 3 Credits.
This course explores the contemporary experience of migrants. Various theoretical approaches are introduced, with the emphasis on a political-economic approach. (GHA)

Rules & Requirements
Grading Status: Letter grade.

GEOG 453. Political Geography. 3 Credits.
The geography of politics is explored at the global, the nation-state, and the local scale in separate course units, but the interconnections between these geographical scales are emphasized throughout. (GHA)

Rules & Requirements

IDEAs in Action Gen Ed: FC-KNOWING or FC-POWER.
Grading Status: Letter grade.
Same as: PWAD 453.

GEOG 456. Geovisualizing Change. 3 Credits.
This course investigates the challenges, tools and techniques, and important applications of visualizing and analyzing geographic data that is temporally dynamic. We tackle technical challenges in obtaining, analyzing, and visualizing dynamic processes in space though maps, and discuss the consequences of our choices in how to re/present these processes. Students will produce original geovisualizations of dynamic data related to their field. Recommended preparation: experience with GIS software (GEOG 370 or GEOG 491).

Rules & Requirements

IDEAs in Action Gen Ed: FC-KNOWING or FC-QUANT.
Requisites: Prerequisite, GEOG 370; permission of the instructor for students lacking the prerequisite.
Grading Status: Letter grade.

GEOG 457. Rural Latin America: Agriculture, Environment, and Natural Resources. 3 Credits.
This course explores a systems and cultural-ecological view of agriculture, environment, natural resource, and rural development issues in Latin America. It serves as a complement to GEOG 458 Urban Latin America. (Regional) Honors version available.

Rules & Requirements

IDEAs in Action Gen Ed: FC-CREATE or FC-POWER, RESEARCH.
Grading Status: Letter grade.

GEOG 458. Urban Latin America: Politics, Economy, and Society. 3 Credits.
This course examines urban social issues in contemporary Latin America. Cities and their residents will be considered in relation to each other and to North American examples. (Regional)

Rules & Requirements
Requisites: Prerequisite, GEOG 259; permission of the instructor for students lacking the prerequisite.
Grading Status: Letter grade.

GEOG 459. Law, Indigenous Knowledge Systems and Environmental Activism in Latin America. 3 Credits.
This course explores the contradictions of Indigenous people's views on land and the environment and the existing legal frameworks addressing Indigenous peoples land rights across Latin America, focusing on how these contradictions are often shaped by global economic interests. The course highlights the ways in which Indigenous groups resist and adapt to environmental challenges exacerbated by stated sponsored extractive industries usually operating within the framework of legal apparatuses to which indigenous peoples respond to employing a range of strategies from legal battles to grassroots activism and quotidian practices.

Rules & Requirements

IDEAs in Action Gen Ed: FC-GLOBAL or FC-POWER.
Grading Status: Letter grade.
Same as: LTAM 459.

GEOG 460. Geographies of Economic Change. 3 Credits.
This course is designed to explore changing geographies of production and consumption in theory and in practice.

Rules & Requirements

IDEAs in Action Gen Ed: FC-GLOBAL or FC-KNOWING, RESEARCH.
Grading Status: Letter grade.

GEOG 464. Europe Today: Transnationalism, Globalisms, and the Geographies of Pan-Europe. 3 Credits.
A survey by topic and country of Europe west of Russia. Those features that make Europe a distinct and important region today are emphasized. (Regional)

Rules & Requirements
Grading Status: Letter grade.

GEOG 468. Environmental Justice in Urban Europe. 3 Credits.
While much attention has been given to Europe's "green" cities and the region's examples of sustainable development, less attention has been given to the ways in which the uneven distributions of environmental degradation have social and spatial ramifications within and beyond the region. This course will provide an overview of environmental justice in urban Europe to consider the key concepts, topics, debates, and trends shaping people and places there.

Rules & Requirements
Grading Status: Letter grade.

GEOG 470. Political Ecology: Geographical Perspectives. 3 Credits.
Examines foundational concepts and methods and their relevance for understanding nature-society relationships. Discussions on environmental change and conflict and how nature is bound up with relations of power and constructions of identity.

Rules & Requirements

IDEAs in Action Gen Ed: FC-KNOWING or FC-POWER, RESEARCH.
Grading Status: Letter grade.

GEOG 477. Introduction to Remote Sensing of the Environment. 3 Credits.
Covers fundamental theory and mechanics of remote sensing, related theoretical aspects of radiation and the environment, and remote-sensing applications relating to terrestrial, atmospheric, and marine environments. Hands-on experience for application and information extraction from satellite-based imagery through biweekly laboratory assignments. Prepares students for GEOG 577. (GISc)

Rules & Requirements

IDEAs in Action Gen Ed: FC-QUANT.
Requisites: Prerequisite, GEOG 370.
Grading Status: Letter grade.

GEOG 480. Liberation Geographies. 3 Credits.
If freedom is a place (as Ruth Wilson Gilmore maintains), then how do we build freedom? This course pursues this question - in theory and practice - from Black and indigenous perspectives. We engage decolonial critiques of western modernity, which raise the question of how systems of oppression came to be as they are. Then we examine historic and ongoing examples of Black and indigenous liberation including practices of anticolonial place making and Mapping Decolonial Futures.

Rules & Requirements

IDEAs in Action Gen Ed: FC-KNOWING or FC-POWER.
Grading Status: Letter grade.

GEOG 491. Introduction to GIS. 3 Credits.
Stresses the spatial analysis and modeling capabilities of organizing data within a geographic information system. (GISci)

Rules & Requirements
Requisites: Prerequisite, GEOG 370; permission of the instructor for students lacking the prerequisite.
Grading Status: Letter grade.
Same as: PLAN 491.

GEOG 492. Radical Black Thought. 3 Credits.
The premise of this course is that the possibilities articulated by radical Black intellectuals and artists in Africa and its diaspora are key to dismantling systems of oppression. It includes theories of unfreedoms derived from experiences of oppression-colonization, slavery, mass incarceration, racial inequity. It also examines radical Black responses to unfreedoms through practices of mental (de)colonization and moral courage, epistemology and pedagogy, human-earth relationships and environmental justice.

Rules & Requirements
Grading Status: Letter grade.

GEOG 493. Internship. 3 Credits.
Open to junior and senior geography majors. Geography internships combine substantive geographic work experience with an academic project designed to integrate theory and practice. Field work is included.

Rules & Requirements

IDEAs in Action Gen Ed: HI-INTERN.
Repeat Rules: May be repeated for credit. 6 total credits. 2 total completions.
Grading Status: Letter grade.

GEOG 515. Applied Spatial Data Science. 3 Credits.
Students will learn to apply numerous spatial data science skills and tools to solve real-world problems and model geographic phenomena. Material will include theoretical and conceptual underpinnings of the methods and techniques, as well as hands on application in R. Topics include R as a GIS, spatial neighborhoods, spatial autocorrelation, regression, clustering, interpolation, and geovisualization. Real world examples and data spanning physical, social, and health sciences are used throughout the course to promote contextual learning.

Rules & Requirements

IDEAs in Action Gen Ed: RESEARCH.
Requisites: Prerequisites, GEOG 215 and GEOG 370; permission of the instructor for students lacking prerequisites.
Grading Status: Letter grade.

GEOG 541. GIS in Public Health. 3 Credits.
Explores theory and application of geographic information systems (GIS) for public health. The course includes an overview of the principles of GIS in public health and practical experience in its use. (GISci)

Rules & Requirements
Grading Status: Letter grade.

GEOG 542. Neighborhoods and Health. 3 Credits.
This course explores how neighborhood context influences the health of the populations living in them. It includes a survey of neighborhoods and health theory and empirical examples. (GHA)

Rules & Requirements
Grading Status: Letter grade.

GEOG 543. Qualitative Methods in Geography. 3 Credits.
This course teaches qualitative methods in geography for graduate and advanced undergraduate students. We will cover interviews, focus groups, visual, and other methodologies. We will also discuss modes of analysis, coding, and writing up qualitative research for publication.

Rules & Requirements

IDEAs in Action Gen Ed: FC-KNOWING or FC-VALUES.
Grading Status: Letter grade.

GEOG 544. Geographic Information Systems for Impact Evaluation and Health Studies. 3 Credits.
Examines the theory and application of geographic information systems (GIS) for impact evaluation for intervention studies. The course will focus especially on health and economic interventions in the developing world. The course includes an overview of the principles of GIS in impact evaluation and practical experience in its use.

Rules & Requirements
Grading Status: Letter grade.

GEOG 555. Cartography of the Global South. 3 Credits.
This course presents cartographic techniques for better map design, with a focus on mapping the geographies of the Global South. Modern techniques and software will be used for developing and demonstrating proficiency in what are considered standard map design techniques, and we will also study examples from places and map makers outside of dominant cartographic traditions, and maps meant for actors and audiences in the Global South.

Rules & Requirements
Requisites: Prerequisite, GEOG 370.
Grading Status: Letter grade.

GEOG 567. Geospatial Data Analysis with Google Earth Engine. 3 Credits.
This course teaches students key concepts and skills for geospatial data analysis using the rich geospatial data resources, tools, and cloud computing facility on Google Earth Engine for environmental monitoring, mapping, modeling, and visualization. The course will enable students to pursue geospatial data analysis ranging from local to global scales to extract critical information for scientific understanding of the environment and for making science-based policies to address the environmental challenges we face today.

Rules & Requirements

IDEAs in Action Gen Ed: FC-NATSCI or FC-QUANT, RESEARCH.
Requisites: Prerequisite, GEOG 370; Permission of the instructor for students lacking the prerequisite.
Grading Status: Letter grade.

GEOG 570. Geographic Information Analysis. 3 Credits.
This course explores the capabilities of geographic information systems for spatial analysis and modeling. Emphasis is placed on how geographic information analysis is used within scientific research; specifically, students will learn to appropriately choose and interpret geographic methods to answer scientific research questions. Students will complete a rigorous research project of their own choosing and will get experience reviewing others' work and revising their own work. Weekly activities will include both conceptual and hand-on material.

Rules & Requirements

IDEAs in Action Gen Ed: RESEARCH.
Requisites: Prerequisites, GEOG 391 and GEOG 491; permission of the instructor for students lacking prerequisites.
Grading Status: Letter grade.

GEOG 577. Advanced Remote Sensing. 3 Credits.
Acquisition, processing, and analysis of satellite digital data for the mapping and characterization of land cover types. (GISci)

Rules & Requirements

IDEAs in Action Gen Ed: FC-QUANT.
Requisites: Prerequisite, GEOG 370 or 477.
Grading Status: Letter grade.

GEOG 591. Applied Issues in Geographic Information Systems. 3 Credits.
Applied issues in the use of geographic information systems in terrain analysis, medical geography, biophysical analysis, and population geography. (GISci)

Rules & Requirements

IDEAs in Action Gen Ed: FC-QUANT.
Requisites: Prerequisite, GEOG 370, 491, or equivalent.
Grading Status: Letter grade.

GEOG 592. Geographic Information Science Programming. 3 Credits.
This course will teach students the elements of GISci software development using major GIS platforms. Students will modularly build a series of applications through the term, culminating in an integrated GIS applications program.

Rules & Requirements

IDEAs in Action Gen Ed: FC-QUANT.
Requisites: Prerequisite, GEOG 370 or 491.
Grading Status: Letter grade.

GEOG 594. Global Positioning Systems and Applications. 3 Credits.
Global Positioning Systems (GPS) fundamental theory, application design, post processing, integration of GPS data into GIS and GPS application examples (such as public health, business, etc.) will be introduced.

Rules & Requirements
Requisites: Prerequisite, GEOG 370.
Grading Status: Letter grade.

GEOG 597. Ecological Modeling. 3 Credits.
This course focuses on modeling the terrestrial forest ecosystems processes, including population dynamics, energy, water, nutrients, and carbon flow through the ecosystem. (GISci)

Rules & Requirements
Requisites: Prerequisite, BIOL 561 or STOR 455; permission of the instructor for students lacking the prerequisite.
Grading Status: Letter grade.

GEOG 598. GIS and Systems Modeling. 3 Credits.
GIS and Systems Modeling are theory and methodology that use GIS, quantitative models, and systems analysis to describe processes, interactions, and feedbacks in complex systems. Simulation experiments of systems models can be used as a "laboratory" to answer many "what if" questions, which can be used for the evaluation of policies and scenarios.

Rules & Requirements
Requisites: Prerequisite, GEOG 370 or 491.
Grading Status: Letter grade.

GEOG 650. Technology and Democracy Research. 3 Credits.
Are technological choices open to democratic participation? Through a novel research workshop format, this graduate and undergraduate course explores political and geographical dimensions of technological change around key environmental issues--energy, water, and waste.

Rules & Requirements

IDEAs in Action Gen Ed: HI-SERVICE.
Grading Status: Letter grade.

GEOG 691H. Honors. 3 Credits.
By permission of the department. Required of all students aspiring to honors in geography. Directed readings, research, and writing.

Rules & Requirements

IDEAs in Action Gen Ed: RESEARCH.
Grading Status: Letter grade.

GEOG 692H. Honors. 3 Credits.
Required of all students aspiring to honors in geography. Preparation of a senior thesis.

Rules & Requirements

IDEAs in Action Gen Ed: RESEARCH.
Requisites: Prerequisite, GEOG 691H.
Grading Status: Letter grade.

GEOG 697. Capstone Seminar in Geographic Research. 3 Credits.
A systematic study of the approaches, key concepts, and methods of geography, emphasizing the application of these approaches through hands-on independent research designed and implemented by the students. (Core)

Rules & Requirements

IDEAs in Action Gen Ed: FC-KNOWING, RESEARCH.
Grading Status: Letter grade.

Graduate-level Courses

GEOG 702. Contemporary Geographic Thought. 3 Credits.
History and philosophy of the geographic discipline, with particular emphasis on developments in recent decades.

Rules & Requirements
Grading Status: Letter grade.

GEOG 703. Geographic Research Design. 3 Credits.
Introduction to the theory and practice of geographic research. The range of methods available for problem identification and solution are considered through development of specific research proposals.

Rules & Requirements
Grading Status: Letter grade.

GEOG 704. Communicating Geography. 3 Credits.
Seminar introduces new students to current geographic sub-disciplines, faculty research interests and areas of expertise within the Department, and university resources. In this required core course in Geography's graduate curriculum, students also engage with issues of communication, professionalization, and career development in Geography and related fields.

Rules & Requirements
Grading Status: Letter grade.

GEOG 705. Advanced Quantitative Methods in Geography. 3 Credits.
Application of selected multivariate statistical techniques to the analysis of geographic phenomena and problems.

Rules & Requirements
Grading Status: Letter grade.

GEOG 706. Demographic Methods. 3 Credits.
This is an introductory course in demographic research methods. Common methods for measuring demographic indicators (fertility, mortality, migration, population growth, and marriage) will be presented.

Rules & Requirements
Grading Status: Letter grade.

GEOG 710. Advanced Physical Geography - Biogeoscience. 3 Credits.
Examination of the major processes controlling environmental cycling of material and energy at the landscape level, and development of a quantitative understanding of the physical and ecosystem processes responsible for landscape pattern and evolution.

Rules & Requirements
Grading Status: Letter grade.

GEOG 711. Advanced Physical Geography - Hydroclimatology and Bioclimatology. 3 Credits.
Examination of topics focused on the atmospheric and the vegetation and land surface parts of the hydrologic cycle at the micro to global spatial scale and short-term to millennial temporal scale.

Rules & Requirements
Grading Status: Letter grade.

GEOG 715. 715 Land Use/Land Cover Dynamics and Human-Environment Interaction. 3 Credits.
Examination of topics that integrate social, natural, and spatial sciences within the context of human-environment interactions, with an emphasis on landuse/landcover dynamics and spatial digital technologies for linking landscape form and function.

Rules & Requirements
Grading Status: Letter grade.

GEOG 720. Cultural and Political Ecology. 3 Credits.
This course examines the foundations and current literature on cultural and political ecology. Focus is given to the appropriation of "Nature," degradation and deforestation, conservation, famine, postcolonial peasants, resistance, Indigeneit, and property, land distribution, and governmentality.

Rules & Requirements
Grading Status: Letter grade.

GEOG 760. Geographies of Economic Change. 3 Credits.
This course is designed to explore changing geographies of production and consumption in theory and in practice.

Rules & Requirements
Grading Status: Letter grade.

GEOG 790. Spatial Analysis and Computer Modeling. 3 Credits.
This course introduces students to spatial analysis techniques involving points, lines, areas, surfaces, and non-metric spaces, as well as programming basic geographic models on microcomputers.

Rules & Requirements
Grading Status: Letter grade.

GEOG 801. Research Seminar in Earth System Science and Biophysical Geography. 3 Credits.
An in-depth seminar devoted to contemporary faculty research topics in earth system science and biophysical geography. Topics and instructors vary.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.

GEOG 802. Research Seminar in Geographic Information Sciences. 3 Credits.
An in-depth seminar devoted to contemporary faculty research topics in geographic information sciences. Topics and instructors vary.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.

GEOG 803. Research Seminar in Nature-Society Studies and Human-Environment Interactions. 3 Credits.
An in-depth seminar devoted to contemporary faculty research topics in nature-society studies and human-environment interactions. Topics and instructors vary.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.

GEOG 804. Research Seminar in Social Geography. 3 Credits.
An in-depth seminar devoted to contemporary faculty research topics in social geography. Topics and instructors vary.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.

GEOG 805. Research Seminar in International Area Studies, Development, and Globalization. 3 Credits.
An in-depth seminar devoted to contemporary faculty research topics in international area studies, development, and globalization. Topics and instructors vary.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.

GEOG 811. Seminar/Readings in Earth System Science and Biophysical Geography. 3 Credits.
An in-depth seminar devoted to contemporary readings in earth system science and biophysical geography. Topics and instructors vary.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.

GEOG 812. Seminar/Readings in Geographic Information Sciences. 3 Credits.
An in-depth seminar devoted to contemporary readings in geographic information sciences. Topics and instructors vary.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.

GEOG 813. Seminar/Readings in Nature-Society Studies and Human-Environment Interactions. 3 Credits.
An in-depth seminar devoted to contemporary readings in nature-society studies and human-environment interactions. Topics and instructors vary.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.

GEOG 814. Seminar/Readings in Social Geography. 3 Credits.
An in-depth seminar devoted to contemporary readings in social geography. Topics and instructors vary.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.

GEOG 815. Seminar/Readings in International Area Studies, Development, and Globalization. 3 Credits.
An in-depth seminar devoted to contemporary readings in international area studies, development, and globalization. Topics and instructors vary.

Rules & Requirements
Grading Status: Letter grade.

GEOG 900. Special Work in Geography. 1-21 Credits.
Required preparation, two courses in the one hundred bracket or permission of the instructor.

Rules & Requirements
Repeat Rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading Status: Letter grade.

GEOG 993. Master's Research and Thesis. 3 Credits.
Rules & Requirements
Repeat Rules: May be repeated for credit.

GEOG 994. Doctoral Research and Dissertation. 3 Credits.
Rules & Requirements
Repeat Rules: May be repeated for credit.

Contact Information

Department of Geography
Visit Program Website (https://geography.unc.edu/)

Chair
Conghe Song
csong@email.unc.edu

Director of Graduate Studies
Diego Riveros-Iregui
diegori@email.unc.edu

Student Services Manager
Nell Phillips
nphillip@email.unc.edu