Master of Arts in Geography Handbook

AY 2008-09

PROGRAM DESCRIPTION

The M.A. in Geography at UNC Charlotte emphasizes the application of geographic skills, methods, and theories to problem solving in contemporary society. To this end, students are offered a solid foundation in research methods, problem formulation and solution, quantitative methods, computer applications and Geographic Information Science (GIS). All students are required to complete an independent, capstone research project that utilizes these skills. Because faculty and students are active in the community, students frequently have the opportunity to complete their capstone research requirement with either funded or unfunded internships in the private or public sector.

The applied geography program at UNC Charlotte consists of three program concentrations (location analysis, urban-regional analysis and transportation studies) and one formal "Track" in Community Planning. Our applied geography program is recognized as one of the best of its kind in the country. Its graduates go directly into jobs as professional geographers, research and/or marketing specialists, location analysts, planners, transportation specialists, and consulting. About 10 percent of program graduates have gone on to study in Ph.D. programs.

One of the program's greatest strengths is the close relationship between its students and faculty. Small class sizes, close student and faculty contact and a strong sense of community are considered essential components of the learning and teaching environment at UNC Charlotte.

Enrollment
The M.A. in Geography has about 45 continuing students of whom approximately 25 percent are part-time. There are normally about 30-40 students actively pursuing course work at any given time. There are 32 faculty teaching in the department.

Length of the Program
The M.A. program is a 36-hour program and full-time students normally complete their programs in four semesters or two years.

Department Facilities
The Department has a state-of-the art Spatial Analysis Laboratory for teaching and research. The lab has ArcGIS (both workstation and PC versions), ArcView, and the ERDAS Imagine image processing system (on workstations). A set of modeling tools is also available, including VP-Expert (an expert system shell), VINO (a mathematical programming system), Expert Choice (an evaluation package), What-If, and Excel. Departmental faculty direct the UNC Charlotte Center for Applied Geographic Information Science (CAGIS) and the UNC Charlotte Office for Transportation Policy Studies. Adjunct faculty also direct the GIS operations for the Carolinas Land Conservation Network, which is housed in UNC Charlotte's Urban Institute.

GIS Options
GIS courses are organized at three levels. Introductory courses on GIS and Remote Sensing emphasize spatial database development and management, data manipulation, inventory and thematic mapping. Students use advanced GIS, remote sensing and microcomputers for spatial analysis and modeling in both classroom and community based projects. Finally, the Department offers various advanced seminars including Spatial Decision Support Systems (SDSS) focusing on knowledge-based approaches to spatial decision making as well as topical courses structured around GIS applications such as GIS-based Land Use Planning, and GIS Applications in Facility Location.

PROGRAM OR DEGREE REQUIREMENTS

The M.A. in Geography requires a minimum of 36 semester hours of graduate work. Three specific courses (12 semester hours) are required of all students except for students in the Community Planning Track. Further, all students must complete an individual capstone research project. Of the remaining 24 hours, a minimum of 12 hours must be completed at the 5000 or 6000 level. Up to 12 hours may be taken in related work which includes all transfer credit, credit by exam, coursework in other departments and courses taken at the 5000 level. At the discretion of the department, transfer credit totaling up to 6 hours may be accepted from accredited universities. No student may take more than 6 hours in graduate level independent study (GEOG 6800). The specific requirements are:

Required Courses

GEOG 6130 Quantitative Analysis in Geography	3 semester hours
GEOG 6131 Research Design Fundamentals (required in all concentrations)	3 semester hours
GEOG 6040 Community Planning Workshop (required for community planning track only)	3 semester hours
GEOG 7900 (Individual Research Project)	6 semester hours

Elective Courses

Other 5000 or 6000-level courses in Geography --a minimum of	12 semester hours
Related work (outside the Department) or transfer credits in courses numbered 5000 and above—a maximum of	12 semester hours
TOTAL	36 semester hours

PROGRAM CONCENTRATIONS & COMMUNITY PLANNING TRACK

Students may elect to study in one or a combination of three concentrations. Alternatively, they can study in the program's Community Planning Track. The concentrations are location analysis, urban-regional analysis (which offers the greatest programmatic flexibility), and transportation studies. The University's interdisciplinary Community Planning Track is also housed within the M.A. in Geography.

Location Analysis Concentration

Overview: The location analysis concentration offers course work in:

- retail location
- facility siting
- real estate development
- location research
- trade area analysis
- office and industrial location
- applied population analysis
- regional economic development

This concentration prepares students for jobs in location research with retail companies, real estate developers, consulting firms, commercial banks, and economic development agencies or for continued academic training in economic geography and location analysis.

Job Prospects: Job prospects have been very good for students with training in location analysis. Graduates have worked as location analysts for a variety of firms including:

Bank of America	Federated Department Stores	The Dayton Hudson Corporation
Best Buy	GAP	The May Department Stores
Consolidated Stores	General Growth Companies	The Rouse Company
Crestar Bank	Lowe's	Thompson Associates
Crown Petroleum	Red Lobster Restaurants	Wachovia National Bank
Family Dollar Stores	The Buxton Company	Winn-Dixie

Course Work: The following courses are suggested for a concentration in location analysis:

GEOG 5108	Sport, Place and Development (3)
GEOG 5155	Retail Location (3)
GEOG 5255	Applied Population Analysis (3)
GEOG 6000	Selected Topics in Economic Geography (3)
GEOG 6030	Topics in Geographic Techniques (3)
GEOG 6105	Site Feasibility Analysis (3)
GEOG 6103	Real Estate Development (3)
GEOG 6301	Industrial Location (3)
GEOG 6306	Store Location Research (3)
GEOG 6105	Applied Real Estate Development (3)
GEOG 6303	Geography of Knowledge and Information (3)

Urban-Regional Analysis Concentration

Overview: Students in the urban-regional analysis concentration normally pursue course work in one of the following areas:

- community development
- GIS based analysis
- public facility siting
- site feasibility
- regional development
- impact analysis

Students normally gain employment in public sector community development and planning as well as with private sector consulting firms.

Job Prospects: Graduates of the M.A. in Geography program hold positions in a number of local and regional agencies in North Carolina and South Carolina as well as in other states including Connecticut, Ohio, Florida, Georgia, Kentucky, New York, Virginia, and Washington. They have responsibility for a broad range of development issues and tasks including economic development, geographic information systems, housing, land use, community and neighborhood analysis, open space, recreation, and planning administration. Job placement for graduates has been very successful.

Course Work: The following course menu is suggested for a concentration in urban-regional analysis:

GEOG 5101	Cartographic Techniques (3)
GEOG 5103	Computer Mapping (3)
GEOG 5108	Sport, Place and Development (3)
GEOG 5120	Introduction to Geographic Information Systems (4)
GEOG 5130	Advanced Geographic Information Systems (4)
GEOG 5210	Urban Planning Methods (3)
GEOG 5255	Applied Population Analysis (3)
GEOG 5260	Transportation Policy Formulation (3)
GEOG 5265	Transportation Analysis Methods (3)
GEOG 6015	Topics in Regional Geography (3)
GEOG 6103	Real Estate Development (3)
GEOG 6210	The Restructuring City (3)
GEOG 6303	Geography of Knowledge and Information (3)
GEOG 6305	Site Feasibility Analysis (3)
GEOG 6301	Industrial Location (3)
GEOG 6300	Applied Regional Analysis (3)
GEOG 6500	Urban Planning: Theory and Practice (3)
GEOG 6400	Advanced Seminar in Spatial Decision Support Systems (4)

Students choosing to build concentrations in GIS may, in consultation with their advisor, do so within the urban-regional analysis concentration.

Transportation Studies Concentration

Overview: Students in the transportation studies concentration can pursue course work in transportation systems analysis, policy formulation, impact analysis, and planning. This concentration prepares students for jobs in the public and private sector, usually as planners in the public sector, analysts for transportation providers and for consulting companies in the private sector.

Job Prospects: Graduates with the concentration in transportation studies have taken positions with local planning agencies, consulting firms, and transit management companies across North Carolina and the U.S. Recent graduates have worked at:

Bernardin Lochmueller Associates (Evansville, IN)
Charlotte Area Transit (CATS)
Charlotte DOT
Chesapeake Bay Planning Commission
City of Greensboro, NC
ESRI (Charlotte, NC)
Lane Council of Governments (Eugene, OR)
Pittsburgh, Pa., Metropolitan Planning Organization
Raleigh, NC, Metropolitan Planning Organization
TMD, Inc. (Soloma Beach, CA)
Wasatch Front Regional Council (Salt Lake City, UT)

Course Work: The following courses comprise the transportation studies concentration:

GEOG 5040	Transportation Topics (3)
GEOG 5160	Geography of Transportation Systems (3)
GEOG 5260	Transportation Policy Formulation (3)
GEOG 5265	Transportation Analysis Methods (3)
GEOG 5270	Evaluation of Transportation Impacts (3)

In addition, selected course work offered by the Civil Engineering and Marketing Departments is available for students in this program. Additional course work is available through GEOG 6800, Directed Problems, and a capstone Individual Research Internship Project, GEOG 7900.

The Community Planning Track

Overview: The Community Planning Track is structured to provide students with planning skills, methods and theory, and practical experience for careers in community planning. Interdisciplinary perspectives from core coursework in Architecture, Economics, Geography and Public Administration round out the structure of the Track.

Job Prospects: Graduates have been highly successful in finding jobs. Graduates have been hired by local and regional planning agencies to give the Track an excellent placement success rate. AICP certification is typically acquired via employment in these job-providing environments. Graduates of the program hold executive positions in the North Carolina Chapter of the APA, which has excellent support for AICP exam preparation. Perhaps one-third of the students in the Community Planning Track are practicing planners who wish to build and improve their professional skills.

Community Planning Curriculum

Required hours:	36 semester hours	
Core coursework:	21 hours (required of all students)	
GEOG 5210:	Urban Planning Methods	3 hrs.
GEOG 6040/ ARCH 6050:	Community Planning Workshop	3 hrs.
GEOG 6130:	Quantitative Analysis in Geography	3 hrs.
GEOG 6500:	Urban Planning: Theory and Practice	3 hrs.
ARCH 5214:	Dilemmas of Modern City Planning	3 hrs.
MPAD 6324	Financial Analysis for Government and Non-Profit Organizations	3 hrs.
ECON 6250:	Advanced Urban and Regional Economics	3 hrs.
Elective Coursework:	Minimum 9 hours from the following:	
GEOG 5120:	Introduction to Geographic Information Systems	4 hrs.
GEOG 5130:	Advanced Geographic Information Systems	4 hrs
GEOG 5209:	Small Town Planning	3 hrs.
GEOG 5255:	Applied Population Analysis	3 hrs.
GEOG 5260:	Transportation Policy Formulation	3 hrs.
GEOG 5265:	Transportation Analysis Methods	3 hrs.
GEOG 5270:	Evaluation of Transportation Impacts	3 hrs.
ARCH 6050:	The Architecture of Settlements	3 hrs.
ARCH 6050:	Public Spaces in Cities	3 hrs.
ARCH 6050:	Urban Transit and City Form	3 hrs.
ARCH 7103/ 7104:	Urban Design Problems (Topical Studio)	5 hrs.
MPAD 6102:	Legal and Institutional Foundations of Public Administration	3 hrs.
MPAD 6128:	Public Policy Analysis and Program Evaluation	3 hrs.
MPAD 6131:	Public Budgeting and Finance	3 hrs.

MPAD 6330	Program Evaluation for the Public and Non-Profit Sectors	3 hrs.

Capstone Research Project: 6 hours (required of all students)

GEOG 7900:	Individual Research Project (taken in final semester)	6 hrs.

MINIMUM PREPARATION

All graduate students must demonstrate competence in undergraduate subject matter in their area of study. While the Department does not require that applicants have a degree in Geography, prospective graduate students should provide evidence that they are prepared to immediately take full advantage of graduate level course work in Geography.

Students applying to the program should, at a minimum, be familiar with the be familiar with the concepts and materials offered in courses such as basic Economic Geography, Spatial Analysis, Location Theory, and Introduction to Research Methods or Statistics.

All students are encouraged to pursue training in Geographic Information Systems (GIS). To do so, students should already have basic cartography preparation and computer file management and data base skills. The relevant courses at UNC Charlotte are Elements of GIS and Technology, and Cartographic Techniques.

These courses, or their equivalent at other institutions, are considered foundational to the UNC Charlotte Masters of Arts in Geography Program. Students lacking this preparation may, at the discretion of the Graduate Advisory Committee, the Community Planning Interdisciplinary Committee or Department Chair, be required to remedy such deficiencies.

TRANSFER CREDIT AND CREDIT BY EXAMINATION

As many as six semester hours of course work may be transferred from other accredited institutions upon approval of the student's advisor, the departmental Graduate Advisory Committee, and the Dean of the College of Liberal Arts and Sciences. Course credit may also be earned by examination. The specific arrangements for this procedure must be made through the advisor and the course instructor. The total of all transfer credits, credits earned through examination, and related work together may not exceed 12 credit hours.

FINANCIAL ASSISTANCE

The UNC Charlotte Department of Geography M.A. Program currently offers three principal types of financial support for full-time graduate students: teaching assistantships, internships and non-resident tuition adjustments. The Department of Geography at UNC Charlotte makes a formal distinction between assistantships and internships and some of the differences in these two options are outlined below. A limited number of students and receive non-resident tuition adjustments in addition to their assistantships or internships.

Assistantships and Internships
Graduate assistantships are arranged for either one entire semester or for an entire academic year (two semesters or nine months). They are normally scheduled for 16 weeks per semester and the student works 20 hours per week. Assistantships are funded at the rate of $5,000 per semester - $10,000 per academic year. The Department makes every effort to provide funding to every fulltime student in the program. Priority is given first to covering teaching laboratory sections in introductory courses in Geography (Earth Science-Geography), and GIS. Assignments are made on the basis of skill sets that match the content of these labs and the number of sections that require Teaching Assistants. In that context, teaching assistantship responsibilities include the teaching mission of the University and its faculty.

Awarding Assistantships. Students who have applied for assistantships will be informed as soon as possible regarding the status of their application. Appointments may be for one semester or a full academic year. Typically funding is limited to four semesters. For students opting to complete non-funded research projects, financial support is normally limited to a total of four semesters; students opting to complete a paid internship will normally be limited to three semesters of funding on assistantships. An undergraduate GPA of at least a 3.0 is required for eligibility. Assistantships may be rescinded at any time if: (1) the individual is making unsatisfactory progress toward the completion of the degree requirements, or (2) the performance of assistantship duties is unsatisfactory.

The department has a number of financial assistance options available. These include off campus work situations which often are made available to the department only after the new financial/fiscal funding year. For this reason, we are often unable to finalize our funding offers until mid to late summer. Additional funding opportunities occur through departmental grants and contracts with local agencies.

Internships. The M.A. in Geography at UNC Charlotte emphasizes the application of skills, methods and theory to problem solving. Given this focus, the Internship often is a critical, capstone element of many students' programs. Normally with an internship, the capstone research project is completed in the context of the internship. That is, students are still required to complete a capstone research project but the research topic is determined by the internship employer. As such, the nature of internship tasks normally involves the student in a higher level of independent problem solving than the normal assistantship might. Internships are somewhat like consulting contracts. In that sense, internships are more like a part-time job for the student. Since we try to find work settings that fit the student's academic interest, internships offer valuable training opportunities and work experience. The nature of the work will depend entirely on the needs of the client as those needs mesh with the training and background of the student. UNC Charlotte faculty are seldom involved in directing the student working in an internship. The student, in effect, works for the client. Accordingly, internships that result in capstone research products are centered on research questions that are framed by the client. In practice, these private sector-sponsored research experiences occur most frequently within the Location Analysis concentration.

An internship project normally involves a student in the execution of a substantive research task for a private or public sector client. While a research project always involves some oversight and direction from UNC Charlotte faculty and the client, the student is the primary investigator and has the major responsibility for executing a specific "real world" research task or research question.

Internships may involve work executed within the client's work setting requiring the intern to report for work at a pre-established schedule or they may be less structured and more task-oriented. The type of work setting will depend entirely on client preference and the nature of the internship problem or task.

Internships normally last three to five months. In the Internship, the student can work more than 20 hours per week. The student normally is paid somewhere between $1,200 and $2,000 per month depending on the nature of the task undertaken and the estimated time involved. The student can be paid directly by the client or the client may contract with the university to pay the student.

At any given time, there are about 4-5 students involved in internships. The availability of internships depends heavily on demands that arise from off-campus sources. Given the applied thrust of the department, it is our intent to have as many graduate students as possible complete an internship--either funded or unfunded. However, for a variety of reasons, it may not always be possible or advisable to arrange an internship. In such cases, the more traditional thesis style capstone research option is used to complete program requirements.

The student's final work schedule is a matter of juggling needs of the client and the student's class schedule. The only extra consideration we like to give our students is that they are able to take semester breaks. Normally we try to give our off-campus students the same days off as those working on campus receive. Regardless of the breaks, the student is still responsible for completing the 20 hours per week for the length of the semester.

Non-Resident Tuition Adjustments

For students who are not residents of North Carolina (non-residents) UNC Charlotte offers a limited number of tuition adjustments. These tuition adjustments provide a differential that gives non-resident students a substantial reduction in the cost of tuition. Since there are relatively few tuition adjustments awarded at UNC Charlotte, students who receive them are normally among the top students in our program. Typically, fewer than 10 graduate students receive any tuition adjustment each year.

Applying for Funding

Graduate students who are interested in applying for funding can obtain applications from the Department of Geography and Earth Sciences or the Graduate Studies Office of the University. These application forms should be completed and returned with the Graduate Application Packet to the Graduate Admissions Office as early as possible prior to the semester for which the student has applied for admission. Only those students admitted to full standing are eligible for funding. Students who receive funding must carry a course load of at least nine hours.

Because of the availability of non-traditional funding such as off campus assistantships, grants and contract work, UNC Charlotte normally is able to offer funding fairly late in the summer. It is possible that funding opportunities might be

available as late as June or July for those entering in the fall semester and December for the spring semester. Thus even those applicants filing late might still be eligible for funding. Applicants are encouraged to contact the Geography MA Coordinator to explore funding opportunities.

ADVISING

Upon admission to the program each student is assigned a faculty advisor from the student's declared area of interest. This advisor will help guide the student through the design and implementation of program of study tailored to the student's specific needs and career goals. The advisor will generally be available to the student for advice on academic and other matters. Students must confer with their advisors regularly concerning academic matters.

More often than not, students will not work with the same advisor throughout the entire program. Once the student has become familiar with the program and the faculty, it is possible to change advisors by obtaining prior approval from the faculty member with whom the student wishes to work. Advisors should be chosen to match, as nearly as possible, the student's academic and career interests. No student will be allowed to register for a class without the signature of their "official" advisor.

All students are required to formulate a complete plan for their M.A. by the end of their first semester. This plan must be approved by their advisor and will serve as a guide to their course of study while at UNC Charlotte.

ACADEMIC STANDARDS

From the date of admission to graduation, the Department conducts a continuous review of student academic and professional performance. In addition to evaluations conducted within the courses taken by students, the faculty conduct a thorough review of student performance on a regular basis. Continuation in the program is contingent upon a favorable review during these evaluations. Students who consistently show borderline course performance, who are not developing good applied skills in the practice of their chosen area of study, who fail to complete coursework on a timely basis, or who otherwise perform unprofessionally or unsatisfactorily, may be required to complete additional courses or may be terminated from the program.

Department academic standards deviate slightly from university policies stated in appropriate catalogs. An accumulation of two (2) marginal (C) grades, or 1 unsatisfactory (U) grade will result in termination of student's enrollment in the graduate program. In order to continue a program of study, the student must reapply for admission to the program.

Special care should be exercised in completing the requirements of a course in which a grade of Incomplete (I) is received. With the exception of GEOG 6131, where incomplete grades are not normally given, incomplete work must be finished during the next semester in residence, but not later than 12 months after the end of the term in which the "I" was assigned, whichever comes first. However, the course instructor has the option of specifying a completion deadline anytime within the 12-month period. If the "I" is not removed during the specified time, a grade of "U" is automatically assigned. In any case, a student will not be allowed to schedule the final comprehensive examination until all incomplete grades are removed. Also, with the exception of GEOG 7900, no student may have more than two incomplete grades at any time. Students with two or more incompletes may not register for another term.

The Department adheres to the UNCC Code of Student Academic Integrity (http://www.legal.uncc.edu/policies/ps-105.html).

EVALUATION OF ACADEMIC PROGRESS

Graduate student progress will be reviewed every semester by the Graduate Advisory Committee on the basis of input from the graduate faculty and the supervisors of areas in which students are working and studying. Students will be evaluated on the basis of both performance in courses and qualitative and subjective assessments of faculty and supervisors (for assistantships).

Comprehensive Examination
To complete the program, each student must pass a two part comprehensive examination covering both general aspects of the discipline and defense of the individual capstone research project. It is the responsibility of the advisor or committee chair, in consultation with the student, to arrange each of the exams.

The Written Exam - Part 1 of the comprehensive is a written exam in which the student must respond to three questions submitted by the faculty. These questions are solicited from the entire graduate faculty of the Department by a memo sent by student's advisor who then administers the examination. The written comprehensive exam is normally taken during the third semester (for full-time students) and in no case should the student take this exam before accumulating 27 hours of completed course work including courses in progress. This exam may not be administered if the student has outstanding incomplete grades in any course work.

The Defense of the (GEOG 7900) Individual Research Project - Part 2 of the comprehensive exam is the defense of the individual research project (GEOG 7900)—the capstone research project. This exam is generally administered at the discretion of the committee chair and the student. When the advisor is satisfied that the student's research and writing has progressed sufficiently, the research document is provided to the other members of the independent research committee; if they agree that the document is ready for a defense, an exam is scheduled.

Selection of the GEOG 7900 Research Project Committee
All GEOG 7900 Research Projects are evaluated by a committee of faculty. Committees must have a minimum of three members composed of the graduate faculty of the Department or related departments. Additional members are acceptable and in many cases outside members, other departments or internship coordinators from off-campus agencies are advisable. The advisor and the student shall each select one of the two other department members. Committees comprised of more than three members is strongly discouraged; justification of committees formed of more than three must be submitted, in writing, by the student's committee chair for approval by the Program Coordinator.

Capstone research projects may take the form of an internship project report or a more traditional thesis. In the former, the research question is created by the client; in the latter, the question is formed by the student. In either case, an exhaustive literature review is required to set the context for the study and provide a rationale for the research methods that are employed.

TIME LIMIT

All work for the M.A. degree must be completed within a six-year period counting from the beginning of the first term in which credit was earned toward the degree. This includes part-time students.

PREPARING FOR GRADUATION

In anticipation of successful completion of all of the requirements of the Program there are a number of administrative hurdles to jump. This section summarizes degree clearance requirements. Graduation term refers to the term at the end of which the degree will be awarded.

Students, please note that some of the steps listed below are your responsibility and others are the responsibility of your advisor. If you are as sharp as we think you are, you will hound your advisor until the step (usually a form to be filed) is completed.

Application for Admission to Candidacy *(student responsibility in consultation with program advisor)*
Deadline: Should be completed upon successful completion of a minimum of 18 semester hours of graduate work. Please refer to Academic Calendar for deadline set by the Graduate School.

Application for Degree *(student responsibility)*
Deadline: Refer to Academic Calendar for deadlines.

Continuous Enrollment *(student responsibility)*
Deadline: Last day to register for graduation term.
Students must be enrolled for their graduation term. Students who do not enroll for credit-bearing coursework must enroll for the appropriate "zero credit" option.

Comprehensive Exams and Defense of Final Project *(advisor responsibility)*
Deadline: Must be completed by the last day of classes of graduation term
Report of completion is due in the Graduate School by the end of final examination period. The same form is used to notify the Graduate School of successful completion of the:

1) written comprehensive exam
2) defense of individual capstone research project

Zero Credit Registration *(student responsibility)*
Please note. Students who do not complete GEOG 7900 in the term for which they register for it, will pay for zero credits for every fall or spring semester their completion is delayed. Students registering for GEOG 7900 in the spring semester (the spring of second year is typical of most programs) and delaying completion until the summer, will be assessed for one semester of zero credit. The following official statement describes the semester of zero credit:

GEOG 7999: The Registrar has added Graduate Residence 7999 to the course listings of all departments offering Masters degrees. Students involved only with theses, projects, examinations, or other final exercises not involving course work for credit should register for Geog 7999. This course is restricted (written department permission required), offered on a "no grade intended" basis, and repeatable until the student finishes.

FACULTY AND SPECIALTIES

Craig Allan, Ph.D., York University. Associate Professor and Earth Sciences M.S. Graduate Coordinator - surface hydrology, biogeochemistry.
Jake Armour, M.S. University of New Mexico. Lecturer - paleoclimatology, soils.
John F. Bender, Ph.D., SUNY at Stony Brook. Professor - mineralogy, petrology, geochemistry, marine geology.
Andy R. Bobyarchick, Ph.D., SUNY at Albany. Associate Professor - structural geology, tectonics.
Harrison S. Campbell, Ph.D., University of Illinois at Urbana - Champaign. Associate Professor and Geography M.A. Graduate Coordinator - economic geography, regional development, regional analysis.
John Chadwick, Ph. D., University of Florida, Assistant Professor- remote sensing, geochemistry.
Eric Delmelle, Ph.D. SUNY Buffalo, Assistant Professor, Geographic Information Science (GISc).
John Diemer, Ph.D., SUNY at Binghamton. Professor - sedimentology, stratigraphy, sedimentary petrology.
Michael Duncan, Ph.D., University of California at Berkeley. Assistant Professor – land use and transportation planning.
Matt Eastin, Ph.D. Colorado State University. Assistant Professor – meteorology.
Martha Eppes, Ph.D., University of New Mexico. Assistant Professor – soils.
Brian Etherton, Ph.D., The Pennsylvania State University. Assistant Professor – meteorology.
Owen J. Furuseth, Ph.D., AICP, Oregon State. Professor and Associate Provost for Metropolitan Studies and Extended Campus Programs - community planning.
Bill Garcia, ABD, Ph.D. Candidate University of Cincinnati. Lecturer and Earth Sciences Laboratory and Undergraduate Coordinator – vertebrate paleontology, systematics.
Laurie Ann Garo, M.A., University of Wisconsin - Madison. Lecturer–geographic information systems, thematic cartography, cartographic design and crime analysis and mapping.
Bill W. Graves, Ph.D., University of Georgia. Associate Professor – Economic geography, urban geography and regional development.
David T. Hartgen, Ph.D., Northwestern University. Professor Emritus - transportation.
Edd Hauser, Ph.D., North Carolina State University. Professor – transportation.
Scott Hippensteel, Ph.D., University of Delaware. Associate Professor – coastal geology, environmental micropaleontology.
Gerald L. Ingalls, Ph.D., Michigan State. Professor and Chair - political and urban geography, survey methods.
Anne Jefferson, Ph.D., Oregon State University. Assistant Professor – hydrology.
J. Dennis Lord, Ph.D., University of Georgia. Professor Emeritus - urban-economic, retail location, quantitative methods.
Walter Martin, Ph.D., University of Tennessee. Associate Professor - applied climatology, environmental studies.
Ross Meentemeyer, Ph. D., University of North Carolina at Chapel Hill. Associate Professor and Director, Center for Applied Geographic Information Science – Landscape Ecology, Biological Invasions, GIS, Remote Sensing.
Tyrel G. Moore, Ph.D., University of Tennessee. Professor - regional economic development and planning.
Terry Shirley, M.S. Pennsylvania State University. Lecturer – meteorology.
Heather A. Smith, Ph.D., University of British Columbia. Associate Professor - urban, social, global/local restructuring.
Paul D. Smith, B.S., Michigan State. Lecturer, Director, Regional Information System - geographic information systems, computer assisted cartography, transportation.
John Sommer, Ph.D., Boston University. Professor Emeritus - urban and science and technology policy.
Janni Sorensen, PhD., University of Illinois, urban planning.

Jamie L. Strickland, ABD, University of Georgia. Lecturer – population, aging, migration, rural-urban development.

Deborah Strumsky, Ph.D., Cornell University. Assistant Professor – economic geography and regional economic analysis.

Alfred W. Stuart, Ph.D., Ohio State. Professor Emeritus - manufacturing, U.S. South, Polar Regions.

Jean-Claude Thill, Ph.D. Universite Catholique de Louvain. Professor and Knight Distinguished Professor of Public Policy – economic geography, GIS, transportation.

Wayne A. Walcott, Ph.D., University of Illinois. Professor Emeritus and past Senior Associate Provost - economic geography, transportation, location theory and modeling.

Quingfang Wang, Ph.D., University of Georgia, Assistant Professor – urban –economic, population, ethnic labor markets

Wei-Ning Xiang, Ph.D., University of California at Berkeley. Professor - geographic information systems, land use and environmental planning, spatial decision support systems.

MASTER'S COURSES IN GEOGRAPHY

GEOG 5000. Topics in Geography. (3) Major topics in Geography. May be repeated for credit as topics vary. *(Yearly) (Evening)*

GEOG 5040. Transportation Topics. (3) Prerequisite: permission of department. Investigation of special topics in transportation including: transit systems, mobility and travel patterns, land use/transportation interface, air pollution, and information systems. *(Spring) (Alternate years)*

GEOG 5101. Cartographic Techniques. (3) Prerequisite: GEOG 2100. Preparation of maps, figures and charts at a professional level of competence. Techniques to be emphasized include desktop mapping with computers, high resolution imagesetting output, color separation techniques which include computer separations as well as scribing and various related photographic processes. Two laboratories of three hours each per week. *(Spring)*

GEOG 5102. Cartographic Design and Map Construction. (3) Design process and basic map construction techniques with particular emphasis on the graphic elements of map design, planning map design, creating visual hierarchies, the uses of color, and basic mechanical color separation. *(Fall)*

GEOG 5103. Computer Mapping. (3) Prerequisites: GEOG 2100 and CSCI 1100 or 1201 and its lab, or permission of instructor. Automated methods of gathering, storing, manipulating and displaying spatial data. Emphasis on the use of existing software and the design and implementation of geographic data structures and algorithms. *(Spring)*

GEOG 5108. Sport, Place and Development. (3) Prerequisites: GEOG 1105. Examines sport and its impact on the landscape of cities and communities. Implications of sport are examined in terms of urban use, urban social structure, markets, franchise movement and expansion, urban politics, its role in defining sense of place, and its impact on the development of communities and regions. *(Spring)*

GEOG 5120. Introduction to Geographic Information Systems. (4) Prerequisite: permission of instructor. Development, current state-of-the-art and future trends in geographic information processing with emphasis on data gathering, storage, and retrieval, analytical capabilities and display technologies. A laboratory component will include development and completion of an applied GIS research project. Additional requirements for graduate credit. Three lecture hours, one two-hour lab per week. *(Fall)*

GEOG 5130. Advanced Geographic Information Systems. (4) Prerequisite: GEOG 5120 or permission of instructor. Advanced GIS study with emphasis on (1) advanced skills for database development and management; (2) spatial analysis and modeling; and (3) Macro language programming and user interface design. Three lecture hours and a two-hour lab session each week. *(Spring)*

GEOG 5155. Retail Location. (3) Spatial attributes of retailing and related activities. Location patterns, store location research, trade area delineation and consumer spatial behavior. *(Spring)*

GEOG 5160. The Geography of Transportation Systems. (3) Geographical and human factors that affect the movement of goods and people from place to place. Emphasis on transportation routes and networks, commodity flow patterns and the locational implications of freight rates. *(Spring)*

GEOG 5209. Small Town Planning. (3) This course will explore small town population dynamics, rural-urban fringe land use dynamics, and changes in small towns' community identity and sense of place. Emphasis will be placed on the issues and techniques that typify small town planning environments. Students will investigate these issues via field work and data collection at municipal scales within the Charlotte region.

GEOG 5210. Urban Planning Methods. (3) Prerequisite: GEOG 5205 or permission of the instructor. Scope and methods of urban planning. Emphasis on analytical techniques, projections, and data sources used in developing comprehensive planning tasks and strategies. *(Fall)*

GEOG 5255. Applied Population Analysis. (3) Population data sources; measuring population change; elementary projection and estimation techniques; spatial sampling; migration; survey design; applications in the public and private sectors. *(Fall)*

GEOG 5260. Transportation Policy Formulation. (3) Prerequisite: permission of department. Structure of transportation policy at federal, state, and local levels including policies concerning highway financing and investments, congestion, safety, and use and development, energy, transit, and the provision of intercity services. *(Fall) (Alternate years)*

GEOG 5265. Transportation Analysis Methods. (3) Prerequisite: permission of department; statistics recommended. Procedures for analyzing the operation and performance of transportation systems; includes network planning models, minimum path algorithms and assignments; energy, air pollution, and activity analysis models; and research approaches, data sources, time and activity budgets, infrastructure condition and needs assessment. *(Spring) (Alternate years)*

GEOG 5270. Evaluation of Transportation Impacts. (3) Prerequisite: permission of department. Methods and case studies for evaluating impacts and benefits of transportation investments including site-level impact analysis; project, corridor, and area scales; multi-modal evaluation and examination of mutually exclusive alternatives. *(Fall) (Alternate years)*

GEOG 5310. Urban Social Geography. (3) Prerequisites: GEOG 1105 and at least one of GEOG 2200, GEOG 2165, GEOG 3100, or GEOG 3205, or permission of the instructor. Examines the reflexive relationship between society and urban space. Explores the intersection between urban geography and social theory, the evolution of city, community and personal spaces, and the relations and constructions of class, race, gender, and sexuality that shape and are shaped by the urban spaces in which we live and work. *(Spring)*

GEOG 5405. Urban Field Geography. (6) Prerequisite: six hours of urban-related undergraduate courses or permission of instructor. Intensive field studies of cities of the Carolinas, including one-day and overnight trips to cities of the mountains and coastal areas. Emphasis on day study trips within the Piedmont. Exercises include land-use mapping, trip journals, interviews and comparisons of the results of zoning and urban development practices within satellite cities of the Charlotte Metropolitan Statistical Area. *(Summer)*

GEOG 6000. Topics in Economic Geography. (3) Crosslisted as GEOG 8000. Major topics in the location of economic activity. May be repeated for credit as topics vary. *(Yearly) (Evenings)*

GEOG 6005. Topics in Urban Geography. (3) Crosslisted as GEOG 8005. Major topics in the form and structure of urban areas examined generally and in a specific local occurrence. May be repeated for credit as topics vary. *(Yearly) (Evening)*

GEOG 6010. Topics in Political Geography. (3) Crosslisted as GEOG 8010. Major topics in the spatial aspects of political systems with special emphasis on urban and regional spatial patterns examined generally and in a specific local occurrence. May be repeated for credit as topics vary. *(On demand)*

GEOG 6015. Topics in Regional Geography. (3) Intensive examination of major spatial questions in a given region. May be repeated for credit as topics vary. *(On demand)*

GEOG 6030. Topics in Geographic Techniques. (3) Crosslisted as GEOG 8030. Cartographic, remote sensing, quantitative techniques or field techniques. May be repeated for credit as topics vary. *(On demand)*

GEOG 6103. Real Estate Development. (3) Examination of the real estate development process. Identification and evaluation of the critical assumptions and issues related to market and site feasibility, financial feasibility, planning, acquisition, construction, and operation of economically viable commercial real estate projects. *(Fall or Spring)*

GEOG 6105. Applied Real Estate Development. (3) Prerequisite: MBAD 6159/GEOG 6103/ARCH 5068. This course focuses on the application of the processes involved in real estate development. Students will work in groups on a semester project to select a site and prepare an appropriate development plan that emphasizes the market and financial feasibility of the real estate development. *(Fall or Spring)*

GEOG 6120. Spatial Statistics. (3) Crosslisted as GEOG 8120. Prerequisite: GEOG 6130/8130, GEOG 6404/8404, or permission of the instructor. Statistical analysis of the spatial dimension of data. Topics include advanced aspects of spatial autocorrelation, global and local measures of spatial association, modifiable area unit problems, spatially weighted regression, and other spatial models. Emphasis on applying methods and developing skills useful in empirical research.

GEOG 6121. Advanced Seminar on Spatial Modeling. (3) Crosslisted as GEOG 8121. Prerequisite: GEOG 5131, GEOG 5132, or permission of the instructor. This seminar focuses on the theories of spatial modeling and simulation. Topics include, but are not limited to, spatial systems, models for spatial analysis, models for spatial simulation, modeling life-cycle, model verification, validation, and accreditation. *(Fall)*

GEOG 6122. GIS&T and Urban Regional Analysis. (3) Crosslisted as GEOG 8122. Prerequisite: permission of the instructor. This course focuses on the spatial thinking, spatial analytic methods and their GIS applications suited for urban and regional analyses. Modeling approaches include spatial interaction models, spatial optimization methods, spatial diffusion, space-time modeling of individual behavior and integrated transportation land-use models. *(Fall)*

GEOG 6123. Urban Regional Environment. (3) Crosslisted as GEOG 8123 and PPOL 8610. Examination of the nature of urban regions and the basic factors that shape urban regions as they grow. Impact of: geography; history; social factors; economic factors; concerns about gender, race and ethnicity, and class; and other determinants of the nature of urban regions, their problems, and possible policy solutions. *(Spring)*

GEOG 6124. Seminar in Geographic Theory and Research Design. (3) Crosslisted as GEOG 8124. Prerequisite: permission of the instructor. Critical examination of trends in the history and philosophy of geographic thought and research. Principles of research in geography and urban regional analysis.

GEOG 6130. Quantitative Analysis in Geography. (3) Crosslisted as GEOG 8130. Multiple regression, trend surface, factorial analysis, cluster analysis, discriminant analysis. *(Fall) (Evenings)*

GEOG 6131. Research Design Fundamentals. (3) Crosslisted as GEOG 8131. Scientific research and problem solving. Problem identification, bibliographic search, data sources and collection, techniques selection and preparation of reports and proposals. *(Spring) (Evenings)*

GEOG 6132. Seminar in Geography. (3) Study of the current trends in geographic thought and research methods. Pass/No Credit grading. *(On demand)*

GEOG 6210. The Restructuring City. (3) Crosslisted as GEOG 8210 and PPOL 8615. Critical assessment of the causes and consequences of contemporary urban restructuring. Evaluation of theoretical, planning and policy challenges facing urban society associated with global-local change. (*Fall, Alternate years*)

GEOG 6211. Cities and Immigrants. (3) Crosslisted as GEOG 8211. Prerequisite: permission of the instructor. Examination of changing patterns and dynamics of immigrant settlement and adjustment in U.S. and Canadian urban areas. Topical areas include assimilation and integration, identity formation, trans-nationalism, enclave development, labor market involvement, gateway versus new destinations, immigrant suburbanization and socio-spatial isolation. *(Spring, Alternate years)*

GEOG 6212. Urban Labor Markets. (3) Crosslisted as GEOG 8212. Prerequisite: permission of the instructor. This course will explore the changing social and spatial structure of urban labor markets in post-industrialized cities. Special reference to immigrant and minority labor markets in the U.S. Topics include discrimination, industry and occupation concentrations, job queues, ethnic networks, ethnic entrepreneurs, technological change and economic restructuring.

GEOG 6213. Development Issues on the Rural-Urban Fringe. (3) Crosslisted as GEOG 8213. Prerequisite: permission of the instructor. This course focuses on changes in the rural-urban fringe and the resulting fringe geographies including challenges that local and regional governments face with growth management, sense of place, and sustainable integration into their new regional settings.

GEOG 6300. Applied Regional Analysis. (3) Crosslisted as GEOG 8300. Prerequisite: Basic computer skills including spreadsheets. Introduction to methods and techniques used in regional analysis. Topical areas include data sources and collection, regional delineation, community and regional profiles, regional accounts, methods of analysis and impact assessment. Topics are discussed in terms of theory, use, and role in economic geography and regional development. Emphasis is placed on application of economic and demographic methods at the regional level. *(Spring, Alternate years)*

GEOG 6301. Industrial Location. (3) Crosslisted as GEOG 8301. Addresses factors influencing the location of industrial and service activities. Classical theories of industrial location are augmented with contemporary interpretations of the economic landscape. Emphasis is placed on theoretical foundations and new developments in industrial location theory, patterns and trends of industrial location, the site selection process, community impacts of locational decision-making, and the role of governments. Patterns and trends are examined in regional, national, and international perspectives. *(Fall, Alternate years)*

GEOG 6302. Regional Economic Development. (3) Crosslisted as GEOG 8302 and PPOL 8642. Neo-classical and contemporary theories of trade, economic geography and urban and regional development. Topics include theories of urban and regional growth, location theories including industry, central places and growth centers; human capital, labor force and entrepreneurial contributions to growth; policy dimensions of urban growth and development are addressed from theoretical and empirical perspectives. *(Fall)*

GEOG 6303. Geography of Knowledge and Information. (3) Crosslisted as GEOG 8303. Prerequisite: permission of the instructor. Examination of the factors that influence the location of economic activities in the information age. Discussions and lectures explore the geographic aspects of the transition away from manufacturing to information processing as the primary mode of production. The transition is examined in terms of technology development, urban and regional development, information flows and the location of quaternary industry. *(Fall, On demand)*

GEOG 6304. The Transforming North Carolina Economy. (3) Crosslisted as GEOG 8304. Prerequisite: permission of the instructor. An examination of the contemporary and historic forces which shape the economic geography of the state. Themes examined will include human-land interactions, past and present economic transitions and the rural-urban balance within the state. Emphasis will be placed on understanding the economic forces which will most dramatically impact the future. Seminar format.

GEOG 6305. Site Feasibility Analysis. (3) Prerequisite: permission of instructor. Examination of factors affecting the feasibility of land parcels for commercial and residential development with emphasis on the physical evaluation of a given site, the market support for its intended use and the financial support for the proposed development. *(Fall)*

GEOG 6306. Store Location Research. (3) Prerequisite: GEOG 6130 or permission of instructor. Market area analysis and site evaluation methods, including the application of multivariate statistical models, spatial interaction-gravity models, and location-allocation techniques to the retail location analysis task. *(Spring)*

GEOG 6400. Advanced Seminar in Spatial Decision Support Systems (SDSS). (4) Crosslisted as GEOG 8400 and PPOL 8642. Prerequisite: GEOG 5120 or permission of instructor. Theoretical aspects of spatial DSS including technical, social, political and psychological consideration; systems design; systems manipulation; and case studies. Three hours of lecture and one two-hour lab per week. *(Fall)*

GEOG 6401. GIS Programming and Customization. (3) Crosslisted as GEOG 8401. Prerequisite: GEOG 4120/5120 or permission of the instructor**.** This course consists of tutorials, readings, projects, and discussions of how to customize and to program ArcObjects within various programming environments: to program automatic repetitive tasks, to build their own applications, to write geoprocessing scripts, and to develop and customize the Web applications.

GEOG 6402. Multi-Attribute Assessment/Evaluation for Planning & Decision-Making. (3) Crosslisted as GEOG 8402. Prerequisite: permission of the instructor. The course provides a survey and comparison of multi-attribute assessment and evaluation methods in spatial planning and decision-making; and discusses the implementation of these methods with the aid of geographic information techniques. Topics include land suitability/vulnerability assessment, environmental and social impact assessment, risk assessment, site selection, plan evaluation, and multi-criteria decision analysis. *(Spring)*

GEOG 6404. Spatial Data Analysis in GIS. (3) Crosslisted as GEOG 8404. Prerequisite: GEOG 5120 or permission of the instructor. Advanced analytical methods used in GIS and spatial data analysis to advance the understanding of spatial patterns and to invoke powerful principles of spatial thinking. Examination of theoretical and conceptual aspects of algorithms used in GIS software to analyze spatial data. Critical assessment of the use, misuse, abuse and limitations of GIS analytical techniques.

GEOG 6405. Three Dimensional Visualization. (3) Crosslisted as GEOG 8405. Prerequisite: GEOG 4130/5130 or permission of the instructor. This course consists of tutorials, readings, projects, and discussions concerned with how geo-visualization techniques can be used to display geographic information driven from spatial analyses in 3D GIS. Students who successfully complete the course are able to understand advanced geographic information systems, focusing on multi-dimensional data models and three-dimensional geo-visualization as spatial analyses tools. In addition, students work on independent and group projects to develop 3D GIS applications such as 3D Urban Simulation System using existing 3D GIS and visualization software.

GEOG 6500. Urban Planning: Theory and Practice. (3) Crosslisted as GEOG 8500 and PPOL 8616. Critical assessment of alternative planning theories and their application to planning practices. Examination of economic, political, social, cultural and geographical factors affecting the operations of cities and resource distribution. *(Alternate years)*

GEOG 6501. Community Planning Workshop. (3) Crosslisted as ARCH 6050. Problem-solving, client-based course designed to give students experience in applying planning theory and methods to actual problems. Types of problems include growth management, land use planning, regional planning, community development, urban design, infrastructure financing, economic development, and environmental management. Students will gain experience compiling and analyzing community scale data, working with citizens, professional planners, and elected officials and preparing oral reports and technical documents. The workshop setting will build upon and extend conventional classroom instructions. *(Fall)*

GEOG 6600. Transportation Policy. (3) Crosslisted as GEOG 8600 and PPOL 8613. Examination of surface transportation from a public policy perspective. Institutional components and role of government at all levels influencing investment; changes in technology, environment, security, safety, equity, cost-effectiveness, public health and welfare are covered. *(Fall)*

GEOG 6612. Advanced Geography of Transportation Systems. (3) Crosslisted as GEOG 8612. Prerequisite: GEOG 6100/8100 or permission of the instructor. Exploration of transportation systems from a geographic perspective. The course emphasizes the importance of these systems in the past, present and future. The course explores the relationships between the organization of the space economy and transportation, the flow of people, commodity and ideas at different scales of observation from the small picture (urban transportation) to the big, global picture (international transportation), mobility issues in everyday life and in the economy. The social, economic, physical, and political contexts of transportation systems are discussed. The course is also designed to develop analytical capabilities by using a few fundamental techniques of transportation planning and analysis.

GEOG 6643. Rural Development Issues. (3) Crosslisted as GEOG 8643. Prerequisite: Permission of the instructor. This course provides research experiences that focus on policy formulation, and demographic, economic and planning issues in rural areas. *(Fall)*

GEOG 6800. Directed Problems in Geography. (1-4) Crosslisted as GEOG 8800. Individual research into geographic topics. May be repeated one time. *(On demand)*

GEOG 7900. Individual Research Project. (6) Individual research report based on directed study of a topic of geographic significance. Pass/No Credit/ Unsatisfactory grading. *(Fall, Spring)*

GEOG 7999. Master's Degree Graduate Residency Credit. (1) Permission needed from department. *(Fall, Spring, Summer)*

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