

MASTER OF SCIENCE GEOSPATIAL SCIENCE

Program Guide

2012-2013



**Department of Geography
University of North Alabama**

MASTER OF SCIENCE IN GEOSPATIAL SCIENCE

Department of Geography University of North Alabama

PROGRAM OVERVIEW: Geospatial Science is an innovative approach to applying spatial knowledge and technology to solve contemporary problems. The Master of Science in Geospatial Science in the Department of Geography at the University of North Alabama focuses on the multidisciplinary application of geography, the spatial paradigm, and methods of geospatial technologies to prepare students to:

- Solve complex environmental, urban, economic, and business problems;
- Conduct independent research;
- Develop skills in critical thinking and writing; and
- Enter professions requiring knowledge of geospatial methods, analysis, and techniques.

The Master of Science degree in Geospatial Science allows students to choose between a thesis and non-thesis option. All students must complete at least 33 hours of graduate credit, of which nine hours (three classes) are required core courses, six hours of research or thesis, and the remaining eighteen hours of electives, as approved by the student's advisor.

PROGRAM OBJECTIVES: The Master of Science in Geospatial Science has three objectives:

- Provide advanced coursework and independent research opportunities in the theory and application of geospatial science to a broad range of current issues in environmental, urban, economic, business, and social fields.
- Develop advanced critical and spatial thinking abilities and combine these with a problem-solving proficiency through the application of geospatial methods and technology in the areas of Geographic Information Systems (GIS), remote sensing, aerial photograph interpretation, computer cartography, Global Positioning Systems (GPS), spatial statistics, urban and regional planning, and policy analysis.
- Prepare students for private industry, government, and education careers in geospatial science, a field identified by the U.S. Department of Labor as one of the three major growth industries for the twenty-first century.

LEARNING OUTCOMES: Upon completion of the Master of Science in Geospatial Science, graduates will be able to:

1. Ask scientific questions using a geospatial paradigm.
2. Design and conduct research using geospatial methods and technologies.
3. Employ enhanced analytical, critical, and spatial thinking, and knowledge to solve contemporary problems.
4. Graduate with advanced knowledge of geospatial science and thorough competence in the application of geospatial technologies.

ADMISSION REQUIREMENTS: *Applications will not be considered until they are complete, meaning that all of the materials below must be received.* Students applying to the M.S. degree program in Geospatial Science must meet the general requirements for admission into graduate studies at the University of North Alabama as described in the

University's current *Graduate Catalog* (www.una.edu/catalog/). In addition to the general requirements for admission to graduate studies, admission to the Geospatial Science graduate program also requires the following:

1. Application Form: An application form (available and fillable online at <http://una.edu/admissions/graduate-school.html>) is required. This form may be completed online and is *submitted to the Office of Admissions of the University*. Applications must be filed with the Office of Admissions well in advance of, but not later than, two months prior to the opening date of registration for the term. See more information under *Deadlines*, below.
2. Transcripts: Official transcripts from each institution previously attended, including community and junior colleges, must be *submitted to the Office of Admissions of the University*.
3. Preparation: Applicants must hold a bachelor's degree or higher degree in an appropriate field of study from an accredited institution or expect to receive this degree not long after applying to the program. A bachelor's degree is required prior to enrollment in the M.S. program.
4. Scholastic Achievement: Applicants must have a minimum of 3.0 Grade Point Average on a 4.0 scale in the last two years of undergraduate work and in all previous graduate work (if any).
5. Test Scores: Applicants must have a combined score of at least 300 (new scoring system, since August 2011) or 1000 (old scoring system, prior to August 2011) on the verbal and quantitative sections of the Graduate Record Exam (GRE). Test scores must be *sent directly to the Office of Admissions*. Applications will not be considered until GRE scores have been received.
6. Letters of Recommendation: Applicants must submit **three** letters of recommendation from academic or professional sources. At least two letters of recommendation must be provided by faculty members from the applicant's prior undergraduate or graduate program. Letters of Recommendation should be *sent directly to the Director of Graduate Studies in the Department of Geography*.
7. Personal Statement: All applicants must include an essay describing themselves and their interest in the program. Specifically, applicants should answer these questions: 1) Why do you want to enroll in a graduate program? 2) Why do you want to enroll in the M.S. in Geospatial Science program at UNA? 3) What is your area of interest, and what topics would you like to focus on in the Geospatial Science program? It is also helpful to answer these questions as completely and specifically as possible, and to indicate which faculty members in the Department of Geography you would be interested in working with as your supervisor/advisors. Personal statements may also contain additional information about the applicant and his or her background and preparation. Personal statements should be *sent directly to the Director of Graduate Studies in the Department of Geography*.
8. Funding Application and Résumé (only for students applying for funding): If an applicant is applying for funding, he or she must complete the Application for Graduate Assistantship form (see below) and submit a recent résumé. These should be *sent directly to the Director of Graduate Studies in the Department of Geography*.

A departmental Graduate Admission Committee will review each application and make all admission decisions. All applications and supporting documents (other than where specified above) must be submitted to the Office of Admissions of the University in accordance with submission deadlines established by that office. ***Applications will not be considered by the department until all of the materials noted above have been received.***

CONDITIONAL ADMISSION: A student may be conditionally admitted to the M.S. in Geospatial Science program, if, in the opinion of the Graduate Admissions Committee, GRE scores or GPA, though falling slightly below the minimum requirements, are offset by other factors. A student without sufficient prior coursework in geography may be conditionally admitted but required to enroll in undergraduate courses to meet prerequisites for graduate level work.

Students admitted conditionally may receive no more than one B, and no grade of C, D, or F, during the first semester of enrollment in the M.S. in Geospatial Science program. Students receiving more than one B or a grade of C, D, or F in any course during the first semester will be dis-enrolled from the program.

TRANSFER CREDITS: Transfer credits (for graduate courses) will be accepted in accordance with the policy of the University as described in the University of North Alabama *Graduate Catalog*. Generally, the University will accept up to six hours of transfer credit.

APPLICATION DEADLINES: The Department of Geography encourages students, when feasible, to enroll in the M.S. in Geospatial Science program beginning in the fall semester, as the sequence of core courses begins in the fall. The department will, however, consider applications for enrollment beginning in the spring semester. Application deadlines to ensure full consideration (especially for potential funding) are:

March 1 for the fall semester

October 1 for the spring semester

Applications received after these deadlines may or may not be considered, depending on the available spaces in the program. Funding will not be available for students starting the program in the spring semester.

Students will be notified by April 15 for fall semester applications, and by November 15 for spring semester applications, about their acceptance into the program.

FUNDING: The department is able to offer a limited amount of funding to selected students. In order to be considered for funding, all application materials must be received by March 1 for enrollment in the fall semester of the same year. Funding is highly competitive, and not all students admitted into the program can be funded. Funding generally takes the form of a half or full tuition waiver and/or a monthly stipend (9 months per year). Students receiving funding will assist in the teaching and research activities of the department. In general, the department offers selected students funding for two years, contingent upon performance. Funding decisions are based on student performance (GPA, GRE), recommendation letters, personal statement, and the abilities and interests of applicants as they relate to faculty interests and departmental teaching assistant needs.

REQUIRED COURSES: The M.S. in Geospatial Science requires **thirty-three credit hours**. The following courses are the required core courses for program:

- Geographic Thought (GE 600)
- Geographic Methods and Research Design (GE 609)
- Introduction to Geospatial Science (GE 610)

In addition to the three required core courses (totaling nine hours) listed above, students will enroll in six thesis or research hours. The remaining eighteen program hours may be selected from any of the graduate courses offered in the department (see below or the *Graduate Catalog* for details of course offerings).

FACULTY MEMBERS:

David M. Brommer, PhD, *Arizona State University*, Climatology, Climate Change, Precipitation, Severe Weather, Environmental Hazards, Caribbean, North America

Jonathan Fleming, GISP, PhD, *Mississippi State University*, Biogeography, Invasive Species, Landscape and Community Ecology, Ecosystem Resilience, Nature-Society Interactions, GIS, North America

Greg G. Gaston, GISP, PhD, *Oregon State University*, Physical Geography, Remote Sensing, Geomorphology, Climatology, GIS, North America

Lisa Keys-Mathews, GISP, PhD, *University of Memphis*, Environmental Hazards, GIS, Remote Sensing, Cartography, Geographic Education, Nature-Society Interactions, Central and South America, North America

Francis T. Koti, Department Chair, GISP, PhD, *West Virginia University*, Regional Development and Planning, Urban, GIS and Society, Africa, North America

Michael Pretes, Director of Graduate Studies, PhD, *Australian National University*, Geopolitics, Economic, Business, Cultural, Tourism, Nature-Society Interactions, Australia, Pacific, Asia, Arctic, North America

Sunhui Sim, PhD, *Florida State University*, GIS, Remote Sensing, Urban, Geographic Modeling, Geographic Visualization, East Asia, North America

William R. Strong, GISP, PhD, *University of Texas*, Cultural Geography, Cartography, Geographic Education, Geographic Thought, Central America, South Asia, Middle East

**For more information or to submit an application,
please write, call, or visit our website:**

**Department of Geography
University of North Alabama
UNA Box 5064
Florence, AL 35632-0001
256-765-4246
www.una.edu/geography
geospatial@una.edu**

**MASTER OF SCIENCE IN GEOSPATIAL SCIENCE
APPLICATION FOR GRADUATE ASSISTANTSHIP**

University of North Alabama
Department of Geography
UNA Box 5064
Florence, AL 35632-0001



This application simply identifies you as being interested in a graduate assistantship in the Department of Geography. Each application and accompanying résumé is given equal consideration. Applicants are selected on criteria including, but not limited to, grade point average, GRE scores, topical interest, experience, interpersonal skills, recommendation letters, maturity, ability, departmental needs, and available funding.

NAME _____
(Last) (First) (Middle Initial)

ADDRESS _____
(Street) (City) (State) (Zip Code)

PHONE NUMBER _____ E-MAIL _____

TYPE OF ASSISTANTSHIP PREFERRED Teaching Research No Preference

RESEARCH INTEREST(S) _____

If you are interested in a teaching assistantship, circle the classes that you would be interested in assisting:

Physical Geography World Regional Geography Human Geography Geographic Information Systems Cartography Remote Sensing

COMPLETE THIS APPLICATION AND E-MAIL IT, ALONG WITH YOUR ONE-PAGE RÉSUMÉ, TO:

Michael Pretes
Director of Graduate Studies
mjpretes@una.edu

Please include on your résumé your professional and academic experience (especially experience and skills relevant to teaching and/or research assistantships), extracurricular activities, honors, scholarships, projects, prizes, honor societies, and volunteer work, in addition to other standard résumé information.

The Department of Geography requires that a graduate assistant enroll in at least nine credit hours, maintain a 3.0 GPA, and work twenty hours per week for a full assistantship and ten hours per week for a partial assistantship. All graduate student assistants start their assignments the week before classes begin and end the week after exams are over.

COURSE DESCRIPTIONS (all courses are three semester hours):

GE 502. Geopolitics

This course is a study of the role of geographic factors in influencing the political structure of nations. Also listed as PS 502 but creditable only in the field for which registered.

GE 503. Nature and Society Interactions

This course involves a global analysis of human-environment issues including human's impact on the environment and the environment's impact on humans. Topics addressed may include, but are not limited to, global warming, overpopulation, environmental degradation, environmental hazards and disasters, and effective natural resources use. Field work required.

GE 504. Environmental Hazards

Natural and technological events continue to impact people and places across the globe. This course draws upon hazard and disaster experiences to address the nature, impact, and social responses to environmental hazards. Course focus is on the relationship between nature, society and technology and analyzes how people and places experience, cope with, and recovery from environmental disasters.

GE 510. Integration of Geography and History

This course integrates the spatial concepts of geography with the chronological concepts of history. Also listed as HI 510 but creditable only in the field for which registered.

GE 513. Geography of Asia

This course involves an analysis of culture, the distribution of resources and relationships of the citizens to each other and the rest of the world.

GE 520 Principles of Urban and Regional Planning

The course focuses on planning both as a profession and as an important element of city, county, and regional government with primary emphasis on American planning. Both the general nature of planning and the specifics of how to plan will be covered.

GE 554. Remote Sensing

This course expands upon concepts and methods of remote sensing through the digital interpretation of satellite imagery. The interpreted information (data and findings) will support the understanding of the processes involved in land use and land cover analysis, change detection, and the map update process. The course includes lecture and discussion related to remote sensing and image processing theory with associated, practical laboratory exercises and applications of satellite image analysis and digital image processing. Special fee: \$30.00.

GE 535. Geomorphology

The origin and development of land forms and the processes involved. Two class periods, one 2-hour laboratory period per week, and one required field trip per semester. Prerequisite: ES 121 or 131 or GE 111 or 112. Special fee: \$30.00.

GE 560. Advanced Cultural Geography

This course provides a conceptual approach to the study of human environment systems, cultural landscape, ecological perspectives, environmental perception and behavior, and environmental stress.

GE 572. Historical Geography of the United States

This course analyzes the role of geographic conditions in the exploration, settlement, and development of the United States. Also listed as HI 572 but creditable only in the field for which registered.

GE 584. Projects in Geographic Information Systems

The course encompasses advanced reading and discussion of state of the art projects and techniques in Geographic Information Systems, remote sensing, computer cartography, and image processing. Students will conduct a detailed database development project including database design, database populations, data management, and the application of spatial modeling techniques. A field trip is required. Prerequisite: GIS class or experience. Special fee: \$30.00.

GE 599. Independent Study-Practicum

Open to graduate students on approval of the department chair. This course provides for independent study and research under departmental determination, supervision, and evaluation.

GE 600 Geographic Thought (core course)

A study of the history and development of geographic thought, the evolution of the discipline of geography, and contemporary geographic philosophies, paradigms, and debates.

GE 601. Physical Geography for Teachers

Considers the spatial aspects of climate, vegetation, soils, and landforms with special emphasis given to map use and map interpretation skills.

GE 602. Cultural Geography for Teachers

This course considers the spatial aspects of human culture including location, population, migration, economics, politics, and global interdependence with special emphasis on map and atlas interpretation skills.

GE 603. Regional Geography for Teachers

An examination of the spatial distribution of physical and cultural attributes which give uniqueness and diversity to world regional patterns on the earth's surface.

GE 604. Methods and Materials of Geographic Education

The examination and application of instructional procedures and materials focusing upon current geographic objectives, concepts, and methods of learning appropriate to the needs of teachers of geography.

GE 605. Field Experience in Geography

This is a field-oriented approach to the study of environmental concepts, including man-earth relationships and is designed to be offered as a Saturday course during the regular school year or as a short summer course to allow for an adequate block of time to engage in field work.

GE 609. Geographic Methods and Research Design (core course)

This course presents the core competencies required to perform professional level research in Geography. The course will review methods of research design and methodology, with a focus on appropriate geographic and statistical techniques required.

GE 610. Seminar in Geospatial Science (core course)

Geospatial science delves into determining the correct data and technology to address today's issues related to humans and their environment. An understanding of geospatial science provides a distinct perspective on the world, a unique lens through which to examine and interpret events, patterns, and processes that operate on or near the surface of Earth.

GE 620. Planning Theory and Process

This course is designed to provide an overview of the development of planning theory as it applies to the field of Urban and Regional Planning in the United States. The course will critically evaluate trends in planning theory with a focus on the evolution of main ideas and people who have influenced the field of planning in the US. To accomplish this goal,

emphasis will be placed on normative, conceptual, methodological issues and various roles planners play, and also the ethical dilemmas they face in practice.

GE 624. Advanced Remote Sensing

This course provides students with advanced topics in remote sensing and image processing including, change detection, image fusion, principle components analysis, spectral signatures, fuzzy classification, and pattern recognition. This course includes classroom instruction, videos, laboratory exercises, fieldwork, and state-of-the-art digital image processing techniques, all to support the interpretation of satellite imagery for extraction of land use and land cover information. One field trip is required. Pre-requisite: GE523 or graduate image processing course.

GE 625. Cartographic Design and Visualization

This course is concerned with advanced map communication concepts; cartographic visualization; designing graphic solutions to geographic situations and needs; illustrating spatial patterns; and considering cartographic representations in terms of aesthetics. Prerequisite: Cartography or equivalent undergraduate cartography class.

GE 684. Spatial Modeling and Analysis in Geographic Information Science

This course focuses on advanced problem solving in the spatial environment including GIS system planning, and design, error handling and quality control, decision support techniques, exploratory data analysis, and spatial statistics and geostatistical analysis. Course labs and projects will focus on current issues, events and opportunities in GIScience. Prerequisite: GE524 and GE584

GE 692. Research

This course involves the selection of a research topic, collection and analysis of primary and secondary sources, field work, and composition of research paper under faculty supervision. May be taken more than once. Permission of supervising faculty and graduate director required.

GE 695. Thesis

This course involves the selection of a thesis topic, collection and analysis of primary and secondary sources, field work, and composition of thesis and thesis defense under faculty supervision. May be taken more than once. Permission of supervising faculty and graduate director required.

GE 697. Advanced Topics

Selected topics in geospatial science offered by faculty. May be repeated for credit if the topic is different. Permission of supervising faculty and graduate director required.

