ENVIRONMENTAL SCIENCE MANAGEMENT

The Department of Physical and Earth Sciences offers core courses and an area of concentration in environmental science management within the MPA degree program and supporting courses for the MA with a major in liberal studies. Please refer to the Liberal Studies and Public Administration sections of this Bulletin for application materials required, admission requirements, and program requirements for these programs.

A graduate certificate in environmental science management is also available for non-degree students who wish to specialize in the area of environmental science management. Upon satisfactorily completing the requirements of a graduate certificate (comprehensive examination not required for graduate certificate), an entry will be made on the student’s transcript. A student who completes the graduate certificate in environmental science management may apply the 15 hours credit toward the MA with a major in liberal studies or the MPA with a concentration in environmental science management. All course work for the MA and MPA degrees, including the environmental science management course work, must be completed within six years.

APPLICATION MATERIALS REQUIRED FOR A GRADUATE CERTIFICATE IN ENVIRONMENTAL SCIENCE MANAGEMENT

Applicants for the graduate certificate in environmental science management may be permitted to enroll for one semester of graduate course work while completing all other general application procedure requirements.

Applicants for the graduate certificate in environmental science management must submit all the following documentation to the College of Graduate Studies, Jacksonville State University, 700 Pelham Road North, Jacksonville, Alabama 36265-1602 to be considered for admission:

1. Completed JSU Graduate Application for Admission [http://www.jsu.edu/graduate/grad_app.html]
2. Non-refundable $30.00 application processing fee
3. Official transcripts from the postsecondary institutions awarding the bachelor’s degree. (Students who have previously attended JSU do not need to request a transcript from the University.)
4. If English is not the applicant’s native language, the applicant is required to submit an official TOEFL score report or an IELTS score report (please refer to page 18 of this Bulletin).
REQUIRED ENVIRONMENTAL SCIENCE MANAGEMENT COURSES FOR A GRADUATE CERTIFICATE IN ENVIRONMENTAL SCIENCE MANAGEMENT

The student must complete the 15 semester hours of required environmental science management concentration courses listed below:

- ESC 490G Environmental Auditing (3)
- ESC 495G Risk Analysis (3)
- ESC 496G Water Management (3)
- ESC 510 Environmental Laws and Regulations (3)
- ESC 535 Integrated Waste Management (3)

15 Graduate Semester Hours Required for this Program

ENVIRONMENTAL SCIENCE MANAGEMENT COURSES
Prefix ESC

444G. Topics in Environmental Conservation (3) (3). Prerequisites: ESC 500 or its equivalent. In-depth examination of various conservation issues. Topic selection varies, see instructor. May be duplicated for credit for a total of six semester hours.

490G. Environmental Auditing (3). Prerequisite: ESC 500 or its equivalent. Overview of systematic auditing techniques with a focus on regulatory compliance, liability, environmental awareness, and ethics. The course will also cover process mapping as a tool of auditing, the new international standards (ISO 14000) and their implications on future industrial activity. Course will conclude with a class audit of a local facility and software application.

495G. Risk Analysis (3). Prerequisite: ESC 500 or its equivalent. An in-depth study of methodologies for human and environmental risk analysis, with a focus on hazardous chemical releases. Case studies will be evaluated and compared.

496G. Water Management (3). Prerequisites: ESC 300 or ESC 500 or their equivalents. Fundamental principles of the hydrologic processes occurring in watersheds. The material will cover the hydrologic impacts of management activities on watersheds such as: urbanization, farming, forestry, and recreational use. Case studies of watershed management techniques will be used to illustrate problems confronting our nation waters.

500. Concepts in Environmental Science (3). Overview of environmental science principles, environmental health effects of pollutants, and a discussion of possible solutions that can be implemented to minimize or eliminate damage to Earth. Emphasizes the interdisciplinary nature of environmental issues and their solutions. ESC 500 cannot be used to meet program/concentration requirements for graduation.
510. **Environmental Laws and Regulations (3).** Prerequisite: ESC 500 or its equivalent. Laws, regulations, and policies regarding environmental quality. Review of local, state, and national inter-relationships with regard to promulgating environmental regulations. Local issues confronting regulatory agencies will be used to illustrate systems of pollution control and management.

535. **Integrated Waste Management (3).** Prerequisite: ESC 500 or its equivalent. Overview of solid and hazardous waste issues at the local, state, national, and international levels. The focus on waste management will include a systems approach to waste separation and reuse, treatment and disposal of waste from both municipal and industrial activities.

541. **Groundwater Hydrology (3).** Prerequisite: ESC 500 or its equivalent. Basic principles of groundwater hydrology and transport of contaminants in groundwater systems; groundwater system characteristics; hydrologic properties of earth materials.

565. **Hazardous Waste Remediation (3).** Prerequisite: ESC 500 or its equivalent. An overview of physical, chemical and biological techniques for treatment of hazardous wastes, and the application of these techniques to decontaminate soil, water, and air. Case studies will illustrate current field techniques.

591. **Directed Research (3).** Prerequisites: Permission of the instructor and approval of the department head and ESC 500 or its equivalent. In depth study of selected topic(s).
GEOGRAPHICAL INFORMATION SYSTEMS

The Department of Physical and Earth Sciences offers core courses and an area of concentration in geographical information systems (GIS) within the MPA degree program and supporting courses for the MA with a major in liberal studies. Please refer to the Liberal Studies and Public Administration sections of this Bulletin for application materials required, admission requirements, and program requirements these programs.

A graduate certificate in geographical information systems is also available for non-degree students who wish to specialize in the area of geographical information systems. Upon satisfactorily completing the requirements of a graduate certificate (comprehensive examination not required for graduate certificate), an entry will be made on the student’s transcript. A student who completes the graduate certificate in geographical information systems may apply the 15 hours credit toward the MA with a major in liberal studies or the MPA with a concentration in geographical information systems. All course work for the MA and MPA degrees, including the geographical information systems course work, must be completed within six years.

APPLICATION MATERIALS REQUIRED FOR A GRADUATE CERTIFICATE IN GIS

Applicants for the graduate certificate in geographical information systems may be permitted to enroll for one semester of graduate course work while completing all other general application procedure requirements.

Applicants for the graduate certificate in geographical information systems must submit all the following documentation to the College of Graduate Studies, Jacksonville State University, 700 Pelham Road North, Jacksonville, Alabama 36265-1602 to be considered for admission:

1. Completed JSU Graduate Application for Admission (http://www.jsu.edu/graduate/grad_app.html)
2. Non-refundable $30.00 application processing fee
3. Official transcripts from the postsecondary institutions awarding the bachelor’s degree. (Students who have previously attended JSU do not need to request a transcript from the University.)
4. If English is not the applicant’s native language, the applicant is required to submit an official TOEFL score report or an IELTS score report (please refer to page 18 of this Bulletin).
REQUIRED GIS COURSES
FOR A GRADUATE CERTIFICATE IN GIS

NOTE: Students who have not had undergraduate courses in GIS, or no prior experience in GIS using ESRI software, are required to complete GIS 510 as a prerequisite for the required courses.

The student must complete the 15 semester hours of required GIS concentration courses listed below:

GIS  520 Spatial Data Collection and Management (3)
GIS  550 Organization and Management of Spatial Systems (3)
GIS  560 Spatial Data Layout and Design (3)

Two courses from the courses listed below:
GIS  530 Analyzing Spatial Networks (3)
GIS  540 Site Location Analysis (3)
GIS  570 Advanced Topics in Spatial Analysis (3)

15 Graduate Semester Hours Required for this Program

GEOGRAPHICAL INFORMATION SYSTEMS COURSES
PREFIX GIS

510. Introduction to Spatial Analysis (3). An overview of geographic information systems and a foundation in map coordinate systems, map projections, and map scale.

520. Spatial Data Collection and Management (3). Methods of capturing data, acquiring and importing existing spatial data into geographic information systems, deriving spatial information from remotely sensed data, and storing spatial data.

530. Analyzing Spatial Networks (3). Introduction to topology theory and its employment in GIS network analysis. Emphasis on methods of determining efficient paths, modeling network flows, and creating efficient service areas for organization entities.

540. Site Location Analysis (3). Emphasis on evaluating existing site location efficiencies, determining of appropriate point site and area site locations for organizational entities, and analyzing environmental impact analyses using GIS.


560. Spatial Data Layout and Display (3). Fundamentals of map composition and layout, chart creation, data classification, and map design to produce meaningful maps and charts of the results of spatial analysis.

570. Advanced Topics in Spatial Analysis (3)(3). Advanced GIS instruction and work in a variety of topics such as imagery interpretation and classification, surface modeling, spatial manipulation languages, and statistical analysis of spatial data. Can be taken twice for credit.

580. Directed Research (3). Prerequisite: Permission of the instructor.
GEOGRAPHY

The Department of Physical and Earth Sciences offers supporting courses for the MA with a major in liberal studies. For students majoring in secondary education with a teaching field in social science or general science, supporting courses are offered for the MS.Ed. and the Ed.S. degrees. A graduate program is not offered in geography. However, students interested in additional geography courses may enroll in environmental science management courses, and/or geographical information systems (GIS) courses.

GEOGRAPHY COURSES
Prefix GY

403G. Independent Study (1)(1)(1). (Grade of Pass or Fail only.) Permission of instructor required. This course gives the advanced student opportunity to pursue directed research. May be repeated for credit for a total of 3 semester hours.

422G. Geographic Views of History (3). Use of the geographic perspective to examine facets of World, United States, and Alabama history.

431G. Topics in Physical Geography (3)(3)(3). Advanced geographic study of various facets of the natural environment; topic selection varies; see instructor.

445G. Topics in Environmental Conservation (3)(3). Prerequisite: ESC 500 or its equivalent. In-depth examination of various conservation issues. Topic selection varies, see instructor. Examples of the types of topics that could be covered in this course include energy resources, public land management, water or air quality and issues regarding food production. This course may be used to meet degree requirements in the MPA degree with an Environmental Science Management emphasis or in the MA degree with a major in Liberal Studies course work. May be duplicated for credit for a total of six semester hours.

475G. Natural Hazards (3). An introduction to natural hazards, their causes, distribution and impacts. Focus on human perception, vulnerability and risk analysis.

501. Concepts in Cultural Geography (3). Application of geographical concepts and perspectives to the study of the world’s culture regions. (May be used in the social science teaching field with a major in secondary education.)

510. Concepts in Earth Sciences (3)(3)(3). Selected topics in earth science such as atmosphere systems and processes, climatology, landform development, soils and biogeography. See instructor for specific topic(s) each term. (May be used in the general science and social science teaching fields with a major in secondary education.)

580. Directed Studies (3)(3). (Grade of Pass or Fail only.) Prerequisites: Permission of the instructor and approval of the department head.

590. Internship (3)(3). (Grade of Pass or Fail only.) Supervised assignment in an area agency or firm for a minimum of 150 hours.