The curriculum in geology provides a background in the geosciences and opportunity to specialize in an area of interest (i.e., environmental geology, paleontology) through elective major or related courses. It is designed for those interested in preparation for graduate studies or employment in the field of geology.

The curriculum in geography promotes geographic literacy as an indispensable element in any educational program. It focuses on spatial relationships and the view of the Earth as the home of humankind. Geography readies students for careers in public services, consulting companies, state or federal agencies, utilities and other professions, as well as for graduate studies in geography.

Majors

- Geography (http://bulletin.auburn.edu/undergraduate/collegeofsciencesandmathematics/geologyandgeography/geography_major/)
- Geology (http://bulletin.auburn.edu/undergraduate/collegeofsciencesandmathematics/geologyandgeography/geology_major/)
- Geology - Earth System Science Option (http://bulletin.auburn.edu/undergraduate/collegeofsciencesandmathematics/geologyandgeography/geologyearthscienceoption_major/)

Geography Courses

GEOG 1010/1013 GLOBAL GEOGRAPHY (3) LEC. 3. Social Science I Core. Spatial and locational context for analyzing change in the contemporary world, including elements of both physical and cultural environments.

GEOG 1017 HONORS GLOBAL GEOGRAPHY (3) LEC. 3. Pr. Honors College. Spatial and locational context for analyzing change in the contemporary world, including elements of both physical and cultural environments.

GEOG 2000 PROFESSIONAL DEVELOPMENT (1) LEC. 1. Introduction to career opportunities in the Geosciences; goal selection and charting a pathway to success as a professional. Includes writing skills, research and funding opportunities, internships, creation of resumes and ePortfolios, and job applications.

GEOG 2010 HUMAN GEOGRAPHY (3) LEC. 3. Spatial perspectives on modern society such as population change, economics, politics, urban development, and local culture, and geography’s approach to solving problems using case studies and issues.

GEOG 2020 PHYSICAL GEOGRAPHY (3) LEC. 3. Selected elements of the earth’s physical system to include such items as landforms, basic weather elements, soils and vegetation.

GEOG 2800 GEOGRAPHIC METHODS AND TECHNIQUES (4) LEC. 3. LAB. 2. Pr. COMP 1000 or COMP 1003. Departmental approval. Key geographical concepts and production of basic geographical tools for portraying spatial data through laboratory exercises.

GEOG 2850 MAP READING AND ANALYSIS (3) LEC. 2. LAB. 2. Introduction to basic concepts and techniques used to interpret map symbols and to analyze geographic patterns.

GEOG 3000 SPORTS GEOGRAPHY (3) LEC. 3. Geographical basis of sports at different spatial scales, including locational strategies, sportive nationalism, and the urban political economy of sports.

GEOG 3110 UNITED STATES AND CANADA (3) LEC. 3. Survey of the region incorporating physical and cultural elements, providing a synthesis of the economic and political processes of the U.S. and Canada.

GEOG 3120 ALABAMA AND THE SOUTHEAST (3) LEC. 3. Study of the physical and cultural environments of the state.

GEOG 3130 LATIN AMERICA (3) LEC. 3. Survey of physical and human landscape of the region including historical geography, natural resources, economic development and problems and prospects affecting major countries.

GEOG 3140 AFRICA (3) LEC. 3. Analysis of the relationships among diverse population groups and the physical environments of sub-Saharan Africa.

GEOG 3150 EUROPE (3) LEC. 3. Survey of physical and human landscape of the region including historical geography, natural resources, economic development, and problems and prospects affecting several of the major countries.

GEOG 3160 ASIA (3) LEC. 3. Survey of the physical and cultural landscape of Asia, including its development and spatial distribution of resources, with a focus on major countries.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 3300</td>
<td>INTERNATIONAL TRAVEL AND TOURISM (3) LEC. 3</td>
<td></td>
<td>Environmental and cultural patterns that characterize places attractive to tourists. Provides realistic situations for developing travel plans and programs.</td>
</tr>
<tr>
<td>GEOG 3810</td>
<td>CARTOGRAPHY AND GRAPHICS (4) LEC. 2. LAB. 2.</td>
<td></td>
<td>Techniques of map production including relevant computer graphics applications and related laboratory exercises.</td>
</tr>
<tr>
<td>GEOG 4740</td>
<td>SENIOR SEMINAR (2) SEM. 2.</td>
<td></td>
<td>Individual research by geoscience undergraduates is coupled with improved written and oral communication skills along with resume and ePortfolio development. May count GEOG 4740 or GEOL 4740.</td>
</tr>
<tr>
<td>GEOG 4920</td>
<td>INTERNSHIP (3) LEC. 3.</td>
<td></td>
<td>Opportunity to apply classroom experience to real job setting. Course may be repeated for a maximum of 6 credit hours.</td>
</tr>
<tr>
<td>GEOG 4930</td>
<td>DIRECTED STUDIES (1-4) IND.</td>
<td></td>
<td>Departmental approval. Conferences, reading, research and/or reports may fulfill course requirement. Course may be repeated for a maximum of 4 credit hours.</td>
</tr>
<tr>
<td>GEOG 5010</td>
<td>URBAN GEOGRAPHY AND SUSTAINABILITY (3) LEC. 3</td>
<td></td>
<td>Senior standing or Departmental approval. An introduction to the field of urban geography and urban sustainability. Basic principles and processes that constitute the growth of urban areas, history, impact of urbanization, adaptation and mitigation towards a sustainable future.</td>
</tr>
<tr>
<td>GEOG 5210</td>
<td>CLIMATOLOGY (3) LEC. 3.</td>
<td></td>
<td>Pr., Senior standing or departmental approval. An introduction to the field of climatology. Basic principles and processes that constitute the earth’s climate system (e.g. surface-atmosphere energy budge, the hydrologic cycle, and atmospheric motion) as well as climate change and sea level rise.</td>
</tr>
<tr>
<td>GEOG 5220</td>
<td>GEOMORPHOLOGY (3) LEC. 2. LAB. 2.</td>
<td></td>
<td>Basic concepts, terms, and techniques used to identify landforms and their evolutionary processes. Study of the origin of landforms with emphasis on the eologic processes and structures that generate the landforms and applications of landform analysis. Two all-day weekend trips are required. Two one-hour classes and one two-hour laboratory per week.</td>
</tr>
<tr>
<td>GEOG 5300</td>
<td>ADVANCED REGIONAL STUDIES IN GEOGRAPHY (3) LEC. 3</td>
<td></td>
<td>Departmental approval. Spatial patterns of socio-economic development of Latin America and the Caribbean.</td>
</tr>
<tr>
<td>GEOG 5310</td>
<td>GEOGRAPHY OF RURAL CHANGE (3) LEC. 3.</td>
<td></td>
<td>Examination of the patterns and processes associated with population levels and distributions, natural resource management systems, economic development, and cultural landscapes of rural communities. Credit will not be given for both GEOG 5310 and GEOG 6310.</td>
</tr>
<tr>
<td>GEOG 5350</td>
<td>ECONOMIC GEOGRAPHY (3) LEC. 3.</td>
<td></td>
<td>Departmental approval. Economic Geography in a global context. Spatial aspects of resource use, agricultural development, manufacturing production and services.</td>
</tr>
<tr>
<td>GEOG 5380</td>
<td>POLITICAL GEOGRAPHY (3) LEC. 3.</td>
<td></td>
<td>Examination of political processes over space, from local to the global levels. The course examines the development of political space, geographies of voting, the role of identity in shaping nationalism, and the geopolitical relationship between power and place.</td>
</tr>
<tr>
<td>GEOG 5400</td>
<td>GEOGRAPHY OF NATURAL HAZARDS (3) LEC. 3.</td>
<td></td>
<td>Geography of natural hazards and their impacts on society. Credit will not be given for both GEOG 5400 and GEOG 6400.</td>
</tr>
<tr>
<td>GEOG 5500</td>
<td>GEOGRAPHY OF ENVIRONMENTAL MANAGEMENT (3) LEC. 3</td>
<td></td>
<td>Departmental approval. Understanding and application of the theories and methods for the United States’ version of environmental impact assessment.</td>
</tr>
<tr>
<td>GEOG 5510</td>
<td>HUMAN-ENVIRONMENT INTERACTION (3) LEC. 3.</td>
<td></td>
<td>Departmental approval. Investigation of the inter-relationships between humans and their natural or physical environments.</td>
</tr>
<tr>
<td>GEOG 5550</td>
<td>GEOGRAPHY OF WATER RESOURCES (3) LEC. 3.</td>
<td></td>
<td>Study of water use, management, law, and conflicts at local and international scales. May count either GEOG 5550 or GEOG 6550.</td>
</tr>
<tr>
<td>GEOG 5600</td>
<td>GLOBAL RESOURCES AND THE ENVIRONMENT (3) LEC. 3</td>
<td></td>
<td>Departmental approval. Global environmental problems such as climate change, ozone and deforestation and international public agencies and private volunteer movements protecting our global commons.</td>
</tr>
<tr>
<td>GEOG 5700</td>
<td>QUANTITATIVE METHODS AND SPATIAL ANALYSIS (3) LEC. 3</td>
<td></td>
<td>Pr. STAT 2510 or STAT 2513. Pr., STAT 2510 or similar statistics course. Applications of quantitative methods and spatial statistics to environmental, urban and economic systems and implementations of these techniques in GIS and statistical software. Credit will not be given for both GEOG 5710 and GEOG 6710.</td>
</tr>
</tbody>
</table>
GEOG 5710 GEOGRAPHIC FIELD METHODS (3) LEC. 1. LAB. 4. Geographic methods and techniques used to conduct field research investigations of human and physical characteristics of the landscape. Credit will not be given for both GEOG 5710 and GEOG 6710.

GEOG 5720 PANAMA STUDY ABROAD-CLIMATE CHANGE AND ENVIRONMENT (3) LEC. 3. Departmental approval. Four-week course intended to give students a general understanding of the potential impacts of climate change on Panama's environment via a mix of lectures, hands-on activities and field trips.

GEOG 5800 GEOGRAPHIC THOUGHT (3) LEC. 3. Departmental approval. Develops effective thinking skills, evaluates written materials in geography, reviews geographical research and produces written reports and papers related to geographic issues.

GEOG 5820/5823 AERIAL PHOTOGRAPHY AND REMOTE SENSING (4) LEC. 3. LAB. 2. Departmental approval. Aerial photo and satellite digital interpretation, photogrammetry, remote sensing technology and photogrammetry and related laboratory exercises.

GEOG 5830/5833 GEOGRAPHIC INFORMATION SYSTEMS (4) LEC. 3. LAB. 2. Introduction to concepts and techniques used in developing a geographic information system (GIS) for evaluating spatial distribution patterns and spatial relationships.

GEOG 5850 GEOGRAPHIC INFORMATION SYSTEMS APPLICATIONS (3) LEC. 3. LAB. 3. Pr. GEOG 5830 or GEOG 6830. Introducing the concepts and implementations of the geographic information analysis and integrate GIS with real-world applications. This is a follow-up course of GEOG 5830/GEOG/6830.

GEOG 5860 ADVANCED CONCEPTS IN CARTOGRAPHY (3) LEC. 2. LAB. 2. Pr. GEOG 3810. Advanced techniques of map design and production including relevant computer graphics applications and related laboratory exercises. Credit will not be given for both GEOG 5860 and GEOG 6860.

GEOG 5870 ADVANCED REMOTE SENSING (3) LEC. 2. LAB. 2. Pr. GEOG 5820. Explores advanced topics of remote sensing for use in research and analysis. Credit will not be given for both GEOG 5870 and GEOG 6870.

GEOG 5880 ADVANCED GEOGRAPHIC INFORMATION SYSTEMS (3) LEC. 2. LAB. 2. Pr. GEOG 5830. Advanced concepts and techniques used in the collection and analysis of data for evaluating spatial patterns and process. Credit will not be given for both GEOG 5880 and GEOG 6880.

GEOG 5970 SEMINAR IN GEOGRAPHY (3) LEC. 3. Development of modern geographic thinking with attention to applied research topics. Course may be repeated for a maximum of 6 credit hours.

GEOG 6010 URBAN GEOGRAPHY AND SUSTAINABILITY (3) LEC. 3. An introduction to the field of urban geography and urban sustainability. Basic principles and processes that constitute the growth of urban areas, history, impact of urbanization, adaptation and mitigation towards a sustainable future.

GEOG 6210 CLIMATOLOGY (3) LEC. 3. Pr., Senior standing or departmental approval. An introduction to the field of climatology. Basic principles and process that constitute the earth's climate system (e.g surface-atmosphere energy budge, the hydrologic cycle, and atmospheric motion, as well as climate change and sea level rise.

GEOG 6220 GEOMORPHOLOGY (3) LEC. 3. Basic concepts, terms, and techniques used to identify landforms and their evolutionary processes. Credit will not be given for both GEOG 5220 and GEOG 6220.

GEOG 6300 ADVANCED REGIONAL STUDIES IN GEOGRAPHY (3) LEC. 3. Departmental approval. Spatial patterns of socioeconomic development of Latin America and the Caribbean.

GEOG 6310 GEOGRAPHY OF RURAL CHANGE (3) LEC. 3. Examination of the patterns and processes associated with population levels and distributions, natural resource management systems, economic development, and cultural landscapes of rural communities. Credit will not be given for both GEOG 5310 and GEOG 6310.

GEOG 6350 ECONOMIC GEOGRAPHY (3) LEC. 3. Departmental approval. Economic Geography in a global context. Spatial aspects of resource use, agricultural development, manufacturing production and services.

GEOG 6380 POLITICAL GEOGRAPHY (3) LEC. 3. Examination of political processes over space, from local to the global levels. The course examines the development of political space, geographies of voting, the role of identity in shaping nationalism, and the geopolitical relationship between power and place.

GEOG 6400 GEOGRAPHY OF NATURAL HAZARDS (3) LEC. 3. Geography of natural hazards and their impacts on society. Credit will not be given for both GEOG 5400 and GEOG 6400.
GEOG 6500 GEOGRAPHY OF ENVIRONMENTAL MANAGEMENT (3) LEC. 3. Departmental approval. Understanding and application of the theories and methods for the United States' version of environmental impact assessment.

GEOG 6510 HUMAN-ENVIRONMENT INTERACTION (3) LEC. 3. Departmental approval. Investigation the inter-relationships between humans and their natural or physical environments.

GEOG 6550 GEOGRAPHY OF WATER RESOURCES (3) LEC. 3. Study of water use, management, law, and conflicts at local and international scales. May count either GEOG 5550 or GEOG 6550.

GEOG 6600 GLOBAL RESOURCES AND THE ENVIRONMENT (3) LEC. 3. Departmental approval. Global environmental problems such as climate change, ozone and deforestation and international public agencies and private volunteer movements protecting our global commons.

GEOG 6700 QUANT METH & SPATIAL ANALYSIS (3) LEC. 3. Pr. STAT 2510 or STAT 2513 or similar statistics course. Applications of quantitative methods and spatial statistics to environmental, urban and economic systems and implementations of these techniques in GIS and statistical software. Credit will not be given for both GEOG 5700 and GEOG 6700.

GEOG 6710 GEOGRAPHIC FIELD METHODS (3) LEC. 1. LAB. 4. Geographic methods and techniques used to conduct field research investigations of human and physical characteristics of the landscape. Credit will not be given for both GEOG 5710 and GEOG 6710.

GEOG 6720 PANAMA STUDY ABROAD-CLIMATE CHANGE AND ENVIRONMENT (3) LEC. 3. Departmental approval. Four-week course intended to give students a general understanding of the potential impacts of climate change on Panama's environment via a mix of lectures, hands-on activities and field trips.

GEOG 6800 GEOGRAPHIC THOUGHT (3) LEC. 3. Departmental approval. Develops effective thinking skills; evaluates written materials in geography; Reviews geographical research and produces written reports and papers related to geographic issues.

GEOG 6820/6826 AERIAL PHOTOGRAPHY AND REMOTE SENSING (4) LEC. 3. LAB. 2. Departmental approval. Aerial photo and satellite digital interpretation, photogrammetry, remote sensing technology and photogrammetry and related laboratory exercises.

GEOG 6830/6836 GEOGRAPHIC INFORMATION SYSTEMS (4) LEC. 3. LAB. 2. Departmental approval. Introduction to concepts and techniques used in developing a geographic information system (GIS) for evaluating spatial distribution patterns and spatial relationships.

GEOG 6850 GEOGRAPHIC INFORMATION SYSTEMS APPLICATIONS (3) LEC. 3. LAB. 3. Pr. GEOG 5830 or GEOG 6830. Introducing the concepts and implementations of the geographic information analysis and integrate GIS with real-world applications. This is a follow-up course of GEOG 5830/GEOG/6830.

GEOG 6860 ADVANCED CONCEPTS IN CARTOGRAPHY (3) LEC. 2. LAB. 2. Pr. GEOG 3810. Advanced techniques of map design and production including relevant computer graphics applications and related laboratory exercises. Credit will not be given for both GEOG 5860 and GEOG 6860.

GEOG 6870 ADVANCED REMOTE SENSING (3) LEC. 2. LAB. 2. Pr. GEOG 6820. Explores advanced topics of remote sensing for use in research and analysis. Credit will not be given for both GEOG 5870 and GEOG 6870.

GEOG 6880 ADVANCED GEOGRAPHIC INFORMATION SYSTEMS (3) LEC. 2. LAB. 2. Pr. GEOG 6830. Advanced concepts and techniques used in the collection and analysis of data for evaluating spatial patterns and processes. Credit will not be given for both GEOG 5880 and GEOG 6880.

GEOG 6970 SEMINAR IN GEOGRAPHY (3) LEC. 3. Departmental approval. Development of modern geographic thinking with attention to applied research topics. Course may be repeated for a maximum of 6 credit hours.

GEOG 7930 DIRECTED STUDIES (1-3) IND/RES. Departmental approval. Individualized literature, field and/or laboratory research not available through regularly offered coursework. Subject matter and credit hours shall be determined by student and directing faculty. Course may be repeated for a maximum of 3 credit hours.

GEOG 7980 CAPSTONE RESEARCH (1-3) RES. SU. Departmental approval. enrolled as GEOG MS non-thesis student. Literature, field and/or laboratory research directed toward the completion of capstone project for non-thesis option. Course may be repeated for a maximum of 3 credit hours.

GEOG 7990 M.S. RESEARCH AND THESIS (1-10) RES. Research and Thesis. Course may be repeated with change in topics.
Geology Courses

GEOL 1100/1103 DYNAMIC EARTH (4) LEC. 3. LAB. 2. Coreq. GEOL 1101. Science Core. General physical geology. Survey of the important minerals and rocks. Origin and classification of geologic structures, earthquakes, and landforms. Study of geologic maps. Credit will not be given for both GEOL 1100 and GEOL 3150.

GEOL 1101 DYNAMIC EARTH LABORATORY (0) LAB. 2. Coreq. GEOL 1100. General physical geology. Survey of the important minerals and rocks. Origin and classification of geologic structures, earthquakes, and landforms study of geologic maps.

GEOL 1107 HONORS DYNAMIC EARTH (4) LEC. 3. LAB. 2. Pr. Honors College. Coreq. GEOL 1108. General physical geology for Honors students and for Geology majors. Topics similar to GEOL 1110 but covered in greater depth. Science Core.

GEOL 1108 HONORS DYNAMIC EARTH LABORATORY (0) LAB. 2. Pr. Honors College or Departmental approval. Coreq. GEOL 1107. General physical geology for Honors students and for Geology majors. Topics similar to those in GEOL 1101 but covered in more depth. Science Core.

GEOL 1110/1113 EARTH AND LIFE THROUGH TIME (4) LEC. 3. LAB. 2. Pr. GEOL 1100 or GEOL 1103 or GEOL 1107. Coreq. GEOL 1111. Science Core. Physical and biological history of the Earth, with emphasis on the interaction between life, the atmosphere, rocks, and oceans. For Honors students and Geology majors. Science Core.

GEOL 1111 EARTH AND LIFE THROUGH TIME LABORATORY (0) LAB. 2. Pr. GEOL 1100 or GEOL 1103 or GEOL 1107. Coreq. GEOL 1110. Examination of rock, fossil, and related data sets bearing on the geological development of the earth with emphasis on North America.

GEOL 1117 HONORS EARTH AND LIFE THROUGH TIME (4) LEC. 3. LAB. 2. Pr. GEOL 1100 or GEOL 1103 or GEOL 1107 or Departmental approval. Coreq. GEOL 1118. Physical and biological history of the Earth, with emphasis on the interaction between life, the atmosphere, rocks, and oceans. For Honors students and Geology majors. Science Core.

GEOL 1118 HONORS EARTH AND LIFE THROUGH TIME LABORATORY (0) LAB. 2. Pr. GEOL 1100 or GEOL 1103 or GEOL 1107 or Departmental approval. Coreq. GEOL 1117. General historical geology for Honors students and Geology majors. Topics similar to those in GEOL 1111 but covered in greater depth. Science Core.

GEOL 1200 MARINE TECHNICAL METHODS (2) LAB. 8. Departmental approval. Introduction to procedures utilized aboard marine research vessels; physical, biological and geological measurements and sampling techniques. Taught only at Dauphin Island Sea Lab. Summer.

GEOL 1220 COASTAL CLIMATOLOGY (2) LEC. 7. Departmental approval. Controlling factors and features of world climates, with attention to coastal areas; application and interpretation of climate data. Taught only at Dauphin Island Sea Lab. Summer only.

GEOL 2000 PROFESSIONAL DEVELOPMENT (1) LEC. 1. Introduction to career opportunities in the Geosciences; goal selection and charting a pathway to success as a professional. Includes writing skills, research and funding opportunities, internships, creation of resumes and ePortfolios, and job applications.

GEOL 2010/2013 MINERALOGY AND OPTICAL CRYSTALLOGRAPHY (5) LEC. 4. LAB. 2. Physical and chemical properties of minerals, classification and roles with emphasis on natural systems, materials science, health, and environment. Credit will not be given for both GEOL 2010 and GEOL 2013.

GEOL 2020 MARINE GEOLOGY (4) LEC. 2. LAB. 4. Departmental approval. Geology of ocean basins; special emphasis on continental shelves, their sediments and the sedimentary process at work there. Taught only at Dauphin Island Sea Lab. Summer only.


GEOL 2100 ENVIRONMENTAL GEOLOGY (4) LEC. 3. LAB. 2. Pr. GEOL 1100 or GEOL 1103 or GEOL 1107. Emphasis on geology as an environmental science; applied geology, geological hazards and environmental regulations as applied to geologic environmental remediation.

GEOL 3100 TERRESTRIAL VEGETATION THROUGH EARTH HISTORY (3) LEC. 2. LAB. 2. Pr. GEOL 2200 and (BIOL 1020 or BIOL 1027). Plants are primary producers and are the foundation upon which the global ecosystem is based. This course focuses on the development, evolution, and application of the plant fossil record to problems in earth history.

GEOL 3150 ENGINEERING GEOLOGY (3) LEC. 2. LAB. 2. Fundamental geologic principles, materials, and processes that affect engineering projects and programs. Emphasis on pre-construction geological analysis to recognize potential hazards and problems. Credit will not be given for both GEOL 3150 and GEOL 1100.

GEOL 3200 INTRODUCTION TO PALEOBIOLOGY (3) LEC. 2. LAB. 2. Pr. GEOL 1110 or GEOL 1113 or GEOL 1107. The nature of the fossil record, applications of that data to geological and biological questions with emphasis on the concepts using examples from all biotic groups.

GEOL 3300 EVOLUTION AND EXTINCTION OF THE DINOSAURIA (3) LEC. 2. LAB. 2. Pr. GEOL 1100 or GEOL 1103 or GEOL 1107. Departmental approval. Survey of the dinosaurs, their evolution and extinction. Southeastern U.S. dinosaurs.


GEOL 3650 FIELD CAMP (6) LEC. 1. LAB. 10. Pr. GEOL 3400. Instruments and methods used in geological field mapping, interpretation of sedimentary, igneous and metamorphic rocks and deformational analysis. Summer only.

GEOL 4010 SEDIMENTARY PETROLOGY (3) LEC. 2. LAB. 2. Pr. GEOL 4010. Departmental approval. Detailed description and classification of sediments and sedimentary rocks with emphasis on interpretation of origins, transport histories, depositional environments and diagenetic histories.


GEOL 4210 ECONOMIC GEOLOGY (3) LEC. 2. LAB. 2. Pr. GEOL 3400. The origin, distribution and classification of mineral deposits formed by igneous, metamorphic and sedimentary processes. Introduction of methods of exploration and development.

GEOL 4260 INTRODUCTION TO GEOCHEMISTRY (3) LEC. 3. Pr. CHEM 1040 and GEOL 2050. Principles governing the distribution of major, minor and trace elements within the earth; differentiation of elements due to geologic processes and the hydrosphere.

GEOL 4300 GEODYNAMICS (3) LEC. 3. Pr. GEOL 3400 and (MATH 1620 or MATH 1623 or MATH 1627) and PHYS 1510. Structure and dynamics of the earth deduced from seismology, gravity, heat flow and magnetism.

GEOL 4740 SENIOR SEMINAR (2) SEM. 2. Geology majors with upperclass standing. Individual research by geoscience undergraduates is coupled with improved written and oral communication skills along with resume and ePortfolio development. May count either GEOL 4740 or GEOG 4740.

GEOL 4920 INTERNSHIP (1-3) INT. SU. Geology majors with upper-class standing (juniors or seniors). An opportunity to apply classroom experience to a real job setting. Course may be repeated for a maximum of 6 credit hours.

GEOL 4930 DIRECTED STUDIES IN UNDERGRADUATE RESEARCH (1-3) AAB. Departmental approval. Directed studies in areas of geology not covered by an existing course or to supplement knowledge gained from an existing course. Course may be repeated for a maximum of 3 credit hours.

GEOL 4970 SPECIAL TOPICS IN GEOLOGY (1-4) ST1. Instruction and discussion of selected topics in geosciences. Course may be repeated for a maximum of 8 credit hours.

GEOL 4980 UNDERGRADUATE RESEARCH METHODS (1-3) IND. Departmental approval. Active participation in original research under supervision of a senior investigator. Course may be repeated for a maximum of 3 credit hours.

GEOL 4997 HONORS THESIS (2-4) LEC. 3. Pr. Honors College. May incorporate library, field or laboratory research in any proportion. Written thesis and thesis defense required. Course may be repeated for a maximum of 4 credit hours.

GEOL 5060 INTRODUCTION TO MICROPALEONTOLOGY (3) LEC. 2. LAB. 2. Pr. GEOL 3200 and (BIOL 1030 or BIOL 1037). A survey of major groups of fossils small enough to require a microscope for their study. Foraminifera, radiolaria, and ostracodes are emphasized; minor groups of interest include conodonts, diatoms, dinoflagellates, acritarchs, and chitinozoans. Includes laboratory, discussion sessions, and field work.
GEOL 5100 HYDROGEOLOGY (3) LEC. 2. LAB. 2. Pr. (GEOL 1100 or GEOL 1103 or GEOL 1107) and CHEM 1030 and (MATH 1610 or MATH 1613 or MATH 1617) and PHYS 1500. Departmental approval. Fundamentals of groundwater flow in porous media, hydrodynamic dispersion, determination of aquifer properties and geological aspects of groundwater occurrences.

GEOL 5220 GEOMORPHOLOGY (3) LEC. 2. LAB. 1. Study of the origin of landforms with emphasis on the geologic processes and structures that generate the landforms and applications of landform analysis. Two all-day weekend trips are required. Two one-hour classes and one two-hour laboratory per week.

GEOL 5240 COASTAL GEOMORPHOLOGY (2) LEC. 5. LAB. 4. Departmental approval. Introduction to coastal sediment processes and applied coastal geomorphology; emphasis on waves, tides, sediments and their impact of anthropogenic influences. Taught only at Dauphin Island Sea Lab. Summer only.

GEOL 5300 BASIN ANALYSIS (3) LEC. 2. LAB. 2. Pr. P/C GEOL 4010. Study of analytical techniques of sedimentary basin fills, including thermal history, litho and biofacies analyses, depositional systems, subsurface logs, seismic reflection, provenance history, evolution, sedimentation and subsidence history.

GEOL 5400 PRINCIPLES OF EARTH SCIENCE (3) LEC. 2. LAB. 2. Departmental approval. A special course for in-service and future teachers only. Internal and surficial geologic processes, meteorology and oceanography.

GEOL 5440 ELECTRON MICROPROBE ANALYSIS (3) LEC. 2. LAB. 1. Pr. CHEM 1040 and PHYS 1510. Instruction in the theory and application of EMPA (electron microprobe analysis) and SEM (scanning electron microscopy). The course provides an understanding the EMPA as a research tool for evaluating the composition and structure of a wide range of materials.

GEOL 5500 PETROLEUM GEOLOGY (3) LEC. 3. Pr. GEOL 4010. Coverage of petroleum source rocks, migration, reservoir rock characters, and trapping mechanisms. Overview of exploration methods including well-log analysis and seismic interpretation.

GEOL 5600 APPLIED GEOPHYSICS (4) LEC. 3. LAB. 2. Pr. (GEOL 1100 or GEOL 1103 or GEOL 1107 or GEOL 3150) and (MATH 1620 or MATH 1623 or MATH 1627) and PHYS 1510. Departmental approval. Overview of geophysical methods with applications to resource, tectonic and environmental analyses. Seismic refraction and reflection, gravity, magnetics, electrical and electromagnetic methods will be included.

GEOL 5720 PANAMA STUDY ABROAD-CLIMATE CHANGE AND ENVIRONMENT (3) LEC. 3. Pr., Departmental approval. Four-week course intended to give students a general understanding of the potential impacts of climate change on Panama's environment via a mix of lectures, hands-on activities and field trips.

GEOL 5840 CLIMATE CHANGE AND SOCIETY (3) LEC. 3. The science of Earth's changing climate, the societal influences on climate change, as well as the expected impacts based on the collected scientific evidence. Analyzes key aspects of climate science, the drivers of climate change, Earth's climate trends, the evidence of climate change, the predicted future climate scenarios, the expected impacts, and the array of possible response options.

GEOL 6060 INTRODUCTION TO MICROPALEONTOLOGY (3) LEC. 3. LAB. 1. A survey of major groups of fossils small enough to require a microscope for their study. Foraminifera, radiolaria, and ostracodes are emphasized; minor groups of interest include conodonts, diatoms, dinoflagellates, acritarchs, and chitinozoans. Includes laboratory, discussion sessions, and field work.

GEOL 6100 HYDROGEOLOGY (3) LEC. 2. LAB. 2. Pr. (GEOL 1100 or GEOL 1103 or GEOL 1107) and CHEM 1030 and (MATH 1610 or MATH 1613 or MATH 1617) and PHYS 1500. Departmental approval. Fundamentals of groundwater flow in porous media, hydrodynamic dispersion, determination of aquifer properties and geological aspects of groundwater occurrences.

GEOL 6220 GEOMORPHOLOGY (3) LEC. 2. LAB. 2. Study of origin of landforms with emphasis on geologic processes and structures that generate landforms; includes the applications of landform analysis. May count either GEOL 6220 or GEOG 6220.

GEOL 6240 COASTAL GEOMORPHOLOGY (2) LEC. 5. LAB. 4. Departmental approval. Introduction to coastal sediment processes and applied coastal geomorphology; emphasis on waves, tides, sediments and their impact of anthropogenic influences. Taught only at Dauphin Island Sea Lab. Summer only.

GEOL 6300 BASIN ANALYSIS (3) LEC. 2. LAB. 2. Pr. GEOL 4010. Departmental approval. Study of analytical techniques of sedimentary basin fills, including thermal history, litho and biofacies analyses, depositional systems, subsurface logs, seismic reflection, provenance history, evolution, sedimentation and subsidence history.

GEOL 6400 PRINCIPLES OF EARTH SCIENCE (3) LEC. 2. LAB. 2. Departmental approval. A special course for in-service and future teachers only. Internal and surficial geologic processes, meteorology and oceanography.
GEOL 6440 ELECTRON MICROPROBE ANALYSIS (3) LEC. 2. LAB. 1. Pr. CHEM 1040 and PHYS 1510. Instruction to theory and application of EMPA (electron microprobe analysis) and SEM (scanning electron microscopy). Provides an understanding of EMPA as a research tool for evaluating composition and structure of wide range of materials. GEOL 5440 or GEOL 6440.


GEOL 6600 APPLIED GEOPHYSICS (4) LEC. 3. LAB. 2. Pr. (GEOL 1100 or GEOL 1103 or GEOL 1107 or GEOL 3150) and (MATH 1620 or MATH 1623 or MATH 1627) and PHYS 1510. Departmental approval. Overview of geophysical methods with applications to resource, tectonic and environmental analyses. Seismic refraction and reflection, gravity, magnetics, electrical and electromagnetic methods will be included.

GEOL 6840 CLIMATE CHANGE AND SOCIETY (3) LEC. 3. The course will investigate the science of Earth’s changing climate, the societal influences on climate change, as well as the expected impacts based on the collected scientific evidence. Analysis of peer-reviewed literature on the key aspects of climate science, the drivers of climate change, Earth’s climate trends, the evidence of climate change, predicted future climate scenarios, expected impacts, and the array of possible societal response options to prevent/mitigate the consequences of anthropogenic climate change. The class will have a strong component of discussion of literature and foundational knowledge as well as reflection on what students have learned and the implications of this knowledge for their areas of interest and generally for their lives.

GEOL 7100 GEOCOMMUNICATION (3) LEC. 3. Departmental approval. Instruction and practice in written and oral communication skills necessary for a successful career in the geosciences; emphasis on preparation of scientific articles, technical reports, abstracts, and thesis; preparation and delivery of oral presentations.


GEOL 7200 TECTONICS (3) LEC. 2. LAB. 2. Pr. GEOL 2050 and GEOL 4010. Departmental approval. Emphasis will be placed on plate tectonics and driving forces, evolution of collisional, transform and extensional systems, and dynamic indicators of past and current tectonic processes.

GEOL 7220 GEOGRAPHIC INFORMATION SYSTEMS AND MARINE RESEARCH (3) LEC. 10. LAB. 15. Departmental approval. Introduction to geographical information system (GIS) techniques with a focus on application in the marine environment. Taught only at Dauphin Island Sea Lab. Summer only.


GEOL 7260 AQUEOUS AND ENVIRONMENTAL GEOCHEMISTRY (3) LEC. 2. LAB. 2. Pr. CHEM 1040 and GEOL 2050. Departmental approval. Study of water-rock reactions that control the chemical composition of groundwater; aqueous geochemistry of trace elements; groundwater pollution, remediation and geologic robiology.

GEOL 7286 CLIMATE CHANGE LITERACY AND COMMUNICATION (3) DSL. 3. Must be a graduate student, or obtain departmental consent after undergraduate student meets Auburn University criteria for taking a 7000-level course. Investigates the discipline-based geoscience education lenses of people’s understanding (cognitive), emotional influences (affect), and actions (behavior) about climate change literacy. Critically analyzes misconceptions, mental models, cultural influences, risk perceptions and the best practices for addressing these barriers. May count either GEOL 7280 or GEOL 7286.

GEOL 7300 CYCLES THROUGH EARTH HISTORY (3) LEC. 2. LAB. 2. Pr. GEOL 4100 and GEOL 4260. Discussion of the fundamental processes controlling sedimentary cycles at different physical, biotic, and temporal scales.

GEOL 7310 ISSUES IN PALEONTOLOGY (3) LEC. 3. Pr. GEOL 3200. Advanced applications of paleontological data sets to topics that may include taphonomy, biogeochemistry, evolution, asystematic functional morphology, paleoecology, paleoclimatology and biostratigraphy.

GEOL 7400 ADVANCED ECONOMIC GEOLOGY (3) LEC. 2. LAB. 2. Pr. GEOL 4210. Departmental approval. The practical and theoretical aspects of economic geology as applied to exploration and development of natural resources.
GEOL 7410 GEOLOGY OF ORGANIC MATTER (3) LEC. 2. LAB. 2. Pr. GEOL 4010 and GEOL 4110. Departmental approval. The origins, classifications, taphonomy of organic matter, modern and ancient processes and environments of deposition of organic-rich strata, including hydrocarbon-source rocks and coals. Laboratory and field trips required.

GEOL 7450 MINERAL RESOURCES AND THE ENVIRONMENT (3) LEC. 2. LAB. 2. Pr. CHEM 1040 and GEOL 2050. Overview of geology and geographic distribution of mineral resources; economic aspects affecting their extraction; environmental impacts and cost of mineral resource extraction.

GEOL 7500 PALEOClimatology (3) LEC. 3. Explores how Earth's climate has evolved dynamically over time, varying within restricted boundaries that allowed life to exist and evolve. Explores interactions among Earth's surface abiotic and biotic components, and includes plate tectonics, atmospheric chemistry and physics, and ocean productivity.

GEOL 7550 ADVANCED GEOPHYSICAL METHODS (3) LEC. 2. LAB. 2. Pr. GEOL 6600. Departmental approval. Advanced treatment of geophysical methods, data interpretation and modeling. Applications to resource development and environmental assessments will be explored, with emphasis on seismic methods.

GEOL 7600 PETROLOGY (3) LEC. 2. LAB. 2. Pr. GEOL 2050 and GEOL 4010. Departmental approval. The description, classification, formative processes, and petrologic interpretation of igneous, metamorphic and sedimentary rocks.

GEOL 7610 STRUCTURAL AND METAMORPHIC ANALYSIS (3) LEC. 2. LAB. 2. Pr. GEOL 2050 and GEOL 3400 and GEOL 3650. Quantitative analysis of dynamic, kinematic and chemical responses of rocks and minerals to crustal movements and dynamo thermal metamorphism.

GEOL 7650 FACIES ANALYSIS AND SEQUENCE STRATIGRAPHY (3) LEC. 2. LAB. 2. Pr. GEOL 4010 and GEOL 4110. Departmental approval. Systematic analysis of modern and ancient deposition facies, and their interpretation in a sequence stratigraphic context. Laboratory and field trips required.

GEOL 7700 ANALYTICAL ISOTOPE GEOCHEMISTRY (3) LEC. 2. LAB. 1. Pr. CHEM 1040 or PHYS 1510 or MATH 1620. Biweekly lectures will teach the theory and principles of isotope geochemistry and mass spectrometry, leading to applications in geoscience research. Lab sessions and problem sets will support lectures and emphasize work with various mass spectrometers in the Department of Geosciences.

GEOL 7930 DIRECTED STUDIES (1-3) LEC. 3. Departmental approval. Directed studies. May incorporate literature, field and/or laboratory research in any proportion. Subject matter and credit hours shall be determined by student and directing faculty. Course may be repeated for a maximum of 3 credit hours.

GEOL 7980 CAPSTONE PROJECT (1-3) LEC. SU. Literature, field and/or laboratory research directed towards completion of capstone project required for non-thesis option. Course may be repeated for a maximum of 3 credit hours.

GEOL 7990 RESEARCH AND THESIS (1-10) MST. Departmental Approval. Course may be repeated with change in topics.

GEOL 8900 DIRECTED STUDY (3) IND. 3. Provides exposure to discipline-specific research procedures in Earth System Science. Students will work closely with their mentors to explore an Earth-system problem through directed readings, literature searches, field work, laboratory experimentation, and quantitative analysis.