

Department of Geology, Geography, and Physics

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Mission

The mission of the Department of Geology, Geography, and Physics is as follows:

1. to provide students with a basic understanding and appreciation of the physical, natural and cultural sciences;
2. to train competent geoscientists;
3. to train students in research methods to become lead geoscientists and engineers;
4. to provide Pre-Health Science students with the strong physics background necessary for their degrees;
5. to advance Geosciences and Physics through research;
6. to serve the university and community in the fields of geoscience and physics.

Expected Outcomes

Students are expected to meet the requirements for their prospective Geoscience degree as specified on the following pages.

The Department of Geology, Geography, and Physics is a multi-disciplinary unit that offers a Geoscience major within the Bachelor of Science degree. The major provides concentrations in geology and geography. Minors are available in physics as well as geology and geography. Students can study with highly qualified faculty who provide individualized educational opportunities to achieve the greatest personal potential.

Facilities

Instructional facilities of the department include: three fully equipped geology laboratories; computer-based physics laboratories; a fully-functioning 15 seat geographical information systems/cartography computer lab with a 36"x48" digitizer, a large-format printer plotter and a flatbed scanner; a remote weather station and

a study room. The Physics research facility includes a magnetics lab. Research is available in theoretical and experimental physics. The department is a repository for U.S. Geological Survey maps and maintains a large collection of topographic maps, aerial photographs, rocks, minerals, fossils and visual aids. The department is included in the Tennessee Earthquake Network. Field trips to areas of geological and geographical interest form an integral part of the programs.

Departmental Awards/Scholarships

The Geography Award. A cash award of up to \$300 to an outstanding geography student. Eligible students must have sophomore standing, be a declared geoscience major with a concentration in geography or travel/tourism. Eligible students must submit an application consisting of transcripts of all college work, a letter of intent and an essay explaining why the applicant has chosen geography or travel/tourism as a career. Funding for this award comes from faculty and alumni donations. The geography faculty selects the recipient.

The William T. McCutchen Geology Award. A cash award of \$300 to an outstanding geology student. Eligible students must have sophomore standing, be a declared geoscience major with a concentration in geology and submit an application consisting of transcripts of all college work, a letter of intent and an essay explaining why the applicant has chosen geology as a career. Funding for this award comes from faculty and alumni donations. The geology faculty selects the recipient, which is named in honor of Professor William T. McCutchen, the first geology faculty member at the university.

The David S. Loebbaka Award. A cash award of \$150 to an outstanding astronomy or physics student. The award recognizes Dr. Loebbaka's many contributions to the department and the university. To be eligible a student must have been enrolled in a physics or astronomy course during the fall semester of the year in which the award is presented. The physics faculty selects the recipient based on academic achievement.

Student Organizations

The GeoClub consists of geoscience majors and any students interested in geology, geography and travel and tourism. The club sponsors field trips, activities for National Earth Science Week and participates annually in GeoConclave, which is a regional geoscience competition among university programs. The primary goal of the GeoClub is to provide opportunities for students to learn about the earth, environment and human impact through travel and field experiences. GeoClub endeavors to accomplish this goal through entertaining and enlightening activities involving student participation. Additionally the GeoClub provides service to the university and community through its outreach programs. For more information contact the department.

Eta Alpha is the UT Martin chapter of Sigma Gamma Epsilon, the Earth Sciences National Honor Society. The chapter seeks students who excel in their academics and show an appreciation for the various earth-related sciences of geology, natural resource management, soils science, physical geography and national parks, among others. The objective of SGE is to provide an opportunity for the scholastic and professional development of its members while promoting camaraderie and cooperation among college and university programs devoted to earth sciences. The chapter provides educational programs for area schools and conducts research for publication through the society's journal *The Compass*. Any interested student who meets the requirements of 12 or more semester hours in earth-related sciences with an overall minimum of 3.0 GPA in those courses and minimum 2.67 GPA in all course work need only contact a member of the chapter or faculty adviser Michael Gibson (mgibson@utm.edu) for consideration of membership.

Geoscience Major

B.S. (6810) Curriculum. In addition to the general education requirements for a B.S. degree, a geoscience major must satisfy the requirements of one of the following concentrations. A minor is required for the concentrations in geography; a minor is optional for the geology concentration. The choice of a minor should be made in consultation with an adviser in the concentration.

Geography Concentration (6811). The geography concentration is designed to provide students with a comprehensive training in geographic regions, processes and techniques. In addition to the basic characteristics of the world's regions, students learn about the dynamic processes shaping the earth's natural and cultural environments. Geography majors develop basic skills in research, cartography, remote sensing and geographic information systems (GIS). Potential career fields include: economic development, industrial site selection, transportation systems management and design, land management, publishing, education, cartography, service in state and local government, foreign service and many other professional areas reflecting the increasing uses for geographic analysis throughout the society. Students interested in attending graduate school will also be well prepared for continued study and research. Geography 151 and 152 are prerequisites to the concentration which consists of 32 hours: Geography 201; 202; 210; 305; 365, 380, or 381; 461, 462, or 472; 310 or 471; and 12 additional hours of upper-division geography courses. A minor is required.

Geology Concentration (6812). Geology is the study of the materials and processes which shape the earth's past, present and future. There are many subfields such as oil and gas exploration, environmental geology, paleontology, hydrogeology, geochemistry and geophysics. Geology assumes an increasingly important role in our quest for energy and mineral resources and in our growing concern for the environment. Geologists are typically employed by:

1. private industry such as energy, mining and construction companies;
2. federal government in such agencies as the U.S. Geological Survey, Bureau of Land Management, Bureau of Mines, NASA and the Environmental Protection Agency;
3. state and local governments in state geological surveys, regulatory bodies and regional planning commissions;
4. private consulting firms;
5. academia.

Geology 110 and Geology 120 are prerequisites to the concentration which consists of: Geology 210, 320, 330, 340, 350, 360, 370, 400 and 450 and a minimum of seven additional elective hours of upper-division geology courses. A minor is optional.

Minors

Geography (M-6811). Geography 151 and 152 are prerequisites to a geography minor which consists of the following: Geography 201 or 202, and nine credit hours of upper-division geography courses.

Geology (M-6812). Geology 110 and 120 are prerequisites to a geology minor which consists of a minimum of 15 hours of upper-division geology.

Physics (M-6820). The minor in physics provides a strong support program for degrees in biology, chemistry, computer science, engineering, geography, geology and mathematics and for the pre-professional curricula in the health sciences. Physics 220-221 are prerequisites to a physics minor, which consists of the following 12 hours of upper-division courses: Physics 322, 323, 343, and 491.

Geographic Information Systems (GIS) Certificate Curriculum

Geographic information systems (GIS) technology and applications are integral to many areas in the geosciences and other disciplines. Students who systematically develop skill sets and experience in GIS may possess key advantages in professional advancement and graduate studies. A special certificate which recognizes basic proficiency in geographic information systems (GIS) technology and applications is available.

A GIS Certificate is issued to students who complete the following requirements:

1. Successful completion of all requirements for the bachelor's degree in his or her respective major degree program.
 2. Successful completion of the following:
 - a. Agricultural Engineering Technology 482 Precision Technologies for Agriculture and Natural Resource Management (3)
 - b. Geography 310 Principles of Geographic Information Systems (3)
 - c. any two of the following three courses:
 - Geography 364 Introduction to Remote Sensing (3)
 - Geography 410 Geographic Information Systems: Modeling and Applications (3)
 - Geography 471 Cartography (3)
 - d. one of the following two courses:
 - Agricultural Engineering Technology 401 Research Participation (3)
 - Geography 481 Research Practicum (3)
- Note:** Research projects undertaken through these courses must involve significant application of GIS-related technology.
3. A minimum final grade point average of 3.00 in all of the Agricultural Engineering Technology and Geography courses specified above that are used to earn a certificate.
 4. A minimum final letter grade of C in all of the Agricultural Engineering Technology and Geography courses specified above that are used to earn a certificate.

Courses Offered by Department of Geology, Geography, and Physics

- Astronomy 201 Astronomy (F)
- Astronomy 202 Astronomy (Sp)
- Geography 151 Introduction to Regional Geography: North America, Europe and Russia (F, Sp)
- Geography 152 Introduction to Regional Geography: Asia, Africa and Latin America (F, Sp)
- Geography 180 Topics in Geography (as needed)
- Geography 201 Introduction to Physical Geography (F)
- Geography 202 Introduction to Cultural Geography (Sp)
- Geography 210 Methods in Geoscience (F)
- Geography 305 Principles of Meteorology (F-even, Sp-odd)
- Geography 310 Principles of Geographic Information Systems (F)
- Geography 355 (555) Principles of Geomorphology (Sp-odd)
- Geography 364 (564) Introduction to Remote Sensing (F-even)
- Geography 365 (565) Tennessee's Geologic and Cultural Landscapes (F-odd)
- Geography 375 (575) Earth Systems Science (as needed)
- Geography 380 (580) Geography of North America (as needed)
- Geography 381 (581) Geography of Europe (as needed)

Geography 410 Geographic Information Systems: Modeling and Applications (Sp)
Geography 441-442 (641-642) Travel Study (as needed)
Geography 444 Geography Internship (as needed)
Geography 461 (661) Economic Geography (as needed)
Geography 462 (662) Political Geography (as needed)
Geography 471 (671) Cartography (F)
Geography 472 (672) Climatology (Sp)
Geography 481 Research Practicum (F, Sp)
Geography 491-492 (691-692) Special Topics in Geography (as needed)
Geology 110 Introduction to Physical Geology (F, Sp)
Geology 110H Introduction to Physical Geology (F)
Geology 120 Environmental Geology (F, Sp)
Geology 120H Environmental Geology (Sp)
Geology 121 Engineering Geology (Sp-even)
Geology 210 Methods in Geoscience (F)
Geology 315 (515) Principles of Oceanography (F-odd)
Geology 320 (520) Mineralogy (F-odd)
Geology 325 (525) Fossils: Life Through Time (Sp-even)
Geology 330 (530) Igneous and Metamorphic Petrology (Sp-even)
Geology 340 (540) History of the Earth (F-even)
Geology 345 (545) Natural Hazards (Sp-even)
Geology 350 (550) Principles of Paleontology (Sp-even)
Geology 355 (555) Principles of Geomorphology (Sp-odd)
Geology 360 (560) Sedimentology (F-even)
Geology 365 (565) Tennessee's Geologic and Cultural Landscapes (F-odd)
Geology 370 (570) Principles of Stratigraphy (Sp-odd)
Geology 375 (575) Earth Systems Science (as needed)
Geology 400 (600) Structural Geology (F-even)
Geology 445 (645) Geohydrology (F-odd)
Geology 450 Methods in Field Geology (F)
Geology 475 (675) Travel Studies in Geology: (Title) (as needed)
Geology 485 (685) Special Topics in Geology: (Title) (as needed)
Geology 495 Senior Research Project (as needed)
Geoscience Education 700 Advanced Earth Systems Science (as needed)
Geoscience Education 710 Advanced Physical Geology for Educators (as needed)
Geoscience Education 720 Oceanology for Educators (as needed)
Geoscience Education 730 Understanding Evolution (as needed)
Geoscience Education 740 Field Experience in Geoscience: [Title] (as needed)
Geoscience Education 750 Global Climate Change (as needed)
Geoscience Education 760 Astrophysics for Educators (as needed)
Physics 101 Physics in Everyday Life (F)
Physics 102 Physics in Everyday Life (Sp)
Physics 111 Concepts and Problem Solving in Physics (as needed)
Physics 150 Concepts and Demonstrations in Physics (F, Sp)
Physics 211-212 College Physics (F, Sp)
Physics 220-221 University Physics (F, Sp)
Physics 322 University Physics (F)
Physics 323 University Physics (Sp)

Physics 331-332 (531-532) Mechanics (as needed)

Physics 343 Methods in Physics Research (as needed)

Physics 441-442 (641-642) Electricity and Magnetism (as needed)

Physics 471-472 (671-672) Modern Physics (as needed)

Physics 491-492 (691-692) Special Projects in Physics (as needed)

Complete course descriptions can be found in the Course Description section of the catalog.