College of Geosciences

Administrative Officers
Dean - Kate C. Miller, Ph.D.
Executive Associate Dean and Associate Dean for Research - Jack G. Baldauf, Ph.D.

General Statement
Planet Earth is our home. Humans live on land which occupies only 29 percent of Earth's surface. The remainder is covered by ocean. An envelope of air surrounds Earth. These realms—the lithosphere, hydrosphere, and atmosphere—form the environment for life on this planet. The study of these realms and their interactions with the biosphere and human systems, comprises the Geosciences—Atmospheric Sciences, Geography, Geology and Geophysics, and Oceanography.

The College of Geosciences is home to four academic departments in these disciplines and interdisciplinary academic offerings in Environmental Programs and Water Management and Hydrological Sciences. The mission of the College of Geosciences is to advance new understandings of the Earth system and apply them to the needs of society, to prepare the next generation of geoscientists to conduct research, to find and develop natural resources, and to measure and respond to environmental change. In doing this, the College of Geosciences intends to lead in establishing the geosciences as the most important and impactful scientific discipline of the 21st century. To sustain human society into the future will depend more on the innovation and application of discovery in the geosciences than in other disciplines. The interdisciplinarity of our field is essential to solving today’s grand challenges—understanding global climate change, maintaining air and water quality, and producing adequate energy and food supplies for all people.

Geography studies humans and their interactions with the environment from a spatial perspective using a range of methods and geospatial technologies. As an interdisciplinary field, it synthesizes knowledge from the other geosciences as well as from the social and biological sciences. Geography deals with the processes and forces acting at the surface of Earth, its materials, and structures, and with the history of its development and the evolution of life on its surface and in its waters. Geophysical focuses on the physics of solid Earth. This includes the measurement and understanding of its internal structure, physical properties, and plate motions and their effect on continents and ocean basins. It also includes the detection of natural resources through remote sensing. Atmospheric Sciences includes studies of weather/meteorology, climate and climate change, and air quality through the disciplines of atmospheric dynamics, atmospheric physics, and atmospheric chemistry. Oceanography is the study of the marine environment and its inhabitants. The distribution and nature of marine life, the development of ocean basins, the chemistry of ocean waters, and the dynamics of water masses are the major elements of Oceanography.

Degrees in Oceanography are available only at the graduate level. Atmospheric Sciences, Geography, and Geology & Geophysics offer BS, MS, and PhD degrees; a BA is also available in Geology. The College offers two interdisciplinary BS degrees through Environmental Programs: a BS in Environmental Studies and a BS in Environmental Geosciences. In addition, Geography offers a BS in Geographic Information Science and Technology and a BS in University Studies with a concentration in Geography. The College hosts a graduate program leading to an MS and PhD in Water Management and Hydrological Sciences. A non-thesis Master of Geosciences degree is also offered.

College of Geosciences faculty members participate in research on a broad front of both basic and applied subjects. The College is the Science Operator for the International Ocean Discovery Program (http://iodp.tamu.edu), which is the largest geosciences research program in the world and explores the structure and history of sediments and crust beneath the sea floor. Other coordinated research programs in the College include the Geochemical and Environmental Research Group, the Center for Tectonophysics, Texas Sea Grant, the Berg-Hughes Center for Petroleum and Sedimentary Systems, the Center for Atmospheric Chemistry and the Environment and the Texas Center for Climate Studies. Field work takes both faculty and students around the world to learn about the wide range of environments and processes affecting Earth and its inhabitants. Consequently, faculty bring to their classes the excitement of discovery, state-of-the-art scientific equipment, a knowledge of useful applications to human problems, and good working relations with industry and governments, all of which can help the undergraduate prepare for a rewarding career.

Career opportunities for graduates in the Geosciences are evolving dynamically—in industry, business, education and government at all levels. Geosciences professionals conduct research essential to understanding an increasingly unpredictable Earth; search for sustainable energy, mineral, and water resources; work to predict and mitigate natural hazards; contribute to wise environmental policy development and decision-making; and teach in high schools, colleges, and universities.

Double Major
Students in the College of Geosciences may elect to have two major fields of study within the College, or they may elect to have a major in the College of Geosciences in conjunction with a major in another college provided that both majors lead to the same baccalaureate degree; that is, both must lead to a BA or to a BS. Approval is required by the Associate Dean for Academic Affairs in the College of Geosciences, the current major department, and the proposed major department. Additional permissions may be required if a student elects a double major in two different colleges. Students seeking to double major must have a 3.0 overall GPA and a 3.0 in the current major at the time of application. Students pursuing a double major must:

1. satisfy all University and College requirements;
2. successfully complete departmental requirements in each major, if both majors are in the College of Geosciences; and
3. in cases where one major is in the College of Geosciences and the other is in another college, the student must successfully meet the major field of study requirements for each area as determined by each college.

Minors
Students may choose to complete a minor in the College of Geosciences. All minors will require not less than 15 hours and not more than 18 hours in the discipline; at least 6 hours must be upper-division courses in the discipline. Each student choosing to complete a minor must contact the department offering the minor to determine if specific courses are required.
Change of Major and Transfer Students

Change of Major students are welcomed in the College of Geosciences. Students seeking entry from another major must be in good academic standing, meet approval of the Associate Dean and have shown interest in their new intended major by taking at least one course in the subject. To begin the Change of Major process, students should first contact the academic advisor in the department to which they wish to change. If the student meets minimum criteria, he or she will be referred to the Associate Dean for approval and processing.

Students are welcomed to transfer into the College of Geosciences from other universities and community colleges. Overall, the College of Geosciences requires a prospective student to have completed, or be in progress of completing, a minimum of 24 hours from a list of courses specific to each major outlined on page 56 of this catalog with a cumulative minimum GPR of 3.0. A B or better is required in certain courses if transferring into Meteorology. The College of Geosciences is also participating in the Program for Transfer Admission as well as the Program for System Admission in cooperation with Prairie View A&M University, Tarleton State University, Texas A&M International University, Texas A&M University-Commerce, Texas A&M University–Corpus Christi, Texas A&M University–Kingsville, West Texas A&M University and Texas A&M University–Texarkana.

Teacher Certification

The need for highly qualified teachers is high in the state of Texas. Students in the College of Geosciences are encouraged to consider pursuing a career in teaching. A number of pathways to certification are available. Interested students should consult with their advisors early in their programs and consult options outlined on the certification website. The college collaborates with the College of Science and the College of Education and Human Development on the aggieTEACH Program (http://aggieteach.tamu.edu) and in the University Studies degree program in secondary science teaching. Students in Geography may obtain composite social studies certification with a specialty in Geography through the Secondary Post-Baccalaureate Certification Program (8-12) or alternative certification options.

University Honors Programs

The College of Geosciences participates in the University Honors Programs, which is described in detail at Honors and Undergraduate Research.

International and Cultural Diversity Requirement

Texas A&M University requires its students to meet an International and Cultural Diversity requirement as part of the Graduation requirements. Meeting this requirement will require the careful selection of courses. The student is directed to page 24 of this catalog for detailed information regarding this requirement and also is encouraged to seek the advice of the student’s academic advisor.

Curricula — College of Geosciences

- Environmental Geosciences
- Environmental Studies
- Geographic Information Science and Technology
- Geography
- Geology
- Geophysics
- Meteorology
- University Studies-Geography
- University Studies-GIST

Majors

College of Geosciences

- Bachelor of Science in Environmental Geosciences
- Bachelor of Science in Environmental Studies

Atmospheric Sciences

- Bachelor of Science in Meteorology
- Bachelor of Science in Meteorology and Master of Science in Oceanography, 5-Year Degree Program

Geography

- Bachelor of Science in Geographic Information Science and Technology, Computation, Design and Analysis Track
- Bachelor of Science in Geographic Information Science and Technology, Earth Systems and Analysis Track
- Bachelor of Science in Geographic Information Science and Technology, Human Systems and Society Track
- Bachelor of Science in Geography
- Bachelor of Science in Geography, Human Geography Track
- Bachelor of Science in Geography, Human Geography of the Natural Environment Track
- Bachelor of Science in Geography, Human-Environment Interactions Track
- Bachelor of Science in University Studies, Geographic Information Science and Technology Concentration
- Bachelor of Science in University Studies, Geography Concentration

Geology and Geophysics

- Bachelor of Arts in Geology
- Bachelor of Science in Geology, Environmental Geology Track
- Bachelor of Science in Geology, Petroleum Geology Track
- Bachelor of Science in Geophysics, Environmental Geophysics Track
- Bachelor of Science in Geophysics, Petroleum Geophysics Track
- Bachelor of Arts in Geology and Master of Science in Oceanography, 5-Year Degree Program
- Bachelor of Science in Geology and Master of Science in Oceanography, 5-Year Degree Program

Oceanography

- Bachelor of Science in Environmental Geosciences and Master of Science in Oceanography, 5-Year Degree Program

Minors

College of Geosciences

- Climate Change Minor
- Earth Sciences Minor
- Environmental Geosciences Minor
Department of Atmospheric Sciences
• Meteorology Minor

Department of Geography
• Geography Minor
• Geographic Information Science and Technology (GIST) Minor

Department of Geology and Geophysics
• Geology Minor
• Geophysics Minor

Department of Oceanography
• Oceanography Minor

Certificates
College of Geosciences
• Diversity Certificate in the College of Geosciences

Masters
College of Geosciences
• Master of Geoscience in Geoscience

Department of Atmospheric Sciences
• Master of Science in Atmospheric Sciences

Department of Geography
• Master of Science in Geography

Department of Geology and Geophysics
• Master of Science in Geology
• Master of Science in Geophysics

Department of Oceanography
• Master of Science in Oceanography

Doctoral
Department of Atmospheric Sciences
• Doctor of Philosophy in Atmospheric Sciences

Department of Geography
• Doctor of Philosophy in Geography

Department of Geology and Geophysics
• Doctor of Philosophy in Geology
• Doctor of Philosophy in Geophysics

Department of Oceanography
• Doctor of Philosophy in Oceanography