

DEPARTMENT OF GEOLOGY AND GEOPHYSICS

<http://geoweb.tamu.edu> (<http://geoweb.tamu.edu/>)

Head: J. Newman

Graduate Advisor: F. Marcantonio

Geology

Graduate work in geology is offered at both the master's and doctoral levels. Programs are designed to provide the student with an understanding of the fundamentals of geology and of related disciplines. Research investigations comprise a significant part of each program. Opportunities for research at both the MS and PhD levels are available in a broad range of environmental, hydrologic, and natural resource studies; field, theoretical, and experimental study of the formation of faults and fault networks; induced seismicity; numerical modeling techniques; planetary geology; physical and mechanical properties of Earth materials; integrated quantitative basin analysis; paleontology, paleobiology, and palynology; isotope stratigraphy and global change; water/rock interactions; fate and transport of organic pollutants in the unsaturated and saturated zones; tectonics and structural geology; composition of movement of crustal fluids; crystal chemistry, mineral phase relations, and thermodynamics of mantle rocks; identification and mitigation of geohazards; diagenesis of clastic sediments; clastic and carbonate sedimentology; and sequence stratigraphy.

The department has state-of-the-art laboratory facilities for radiogenic and stable isotope geochemistry, environmental geochemistry, evolutionary biology, paleobiology, rock mechanics, sedimentary geology, petrography, and mineral physics. In addition, sample preparation labs, petrographic microscopes and an extensive network of computers and peripherals are available for student research. More details can be found at <http://geoweb.tamu.edu/> under Research Facilities. The Texas A&M Materials Characterization Facility houses additional transmission and scanning electron microscopes as well as an electron microprobe.

The department benefits from a close association with the Integrated Ocean Drilling Program (IODP). Located in the Texas A&M Research Park adjacent to campus, this oceanographic research program is integral to the research of many faculty members. The IODP facilities include a large core-storage station and physical-properties, petrography, and sedimentary laboratories. Many scientific staff members of the IODP hold adjunct faculty positions in the Department of Geology and Geophysics. The facilities both in the department and elsewhere in the University provide students with an excellent opportunity to use state-of-the-art equipment in their research.

The MS is considered a desirable degree for employment within the environmental and energy industries and requires a written thesis in addition to specified coursework.

The PhD is a college-level teaching and research degree. In addition to graduate studies requirements for the PhD, the student's committee chair will determine broadening areas of study with advice from the other committee members.

Geophysics

The degrees of Master of Science and Doctor of Philosophy are offered in geophysics. Geophysics includes all areas of scientific inquiry that deal with the physical state of the planets and with the dynamic physical processes that act on and within the planets. The deep interior, crust, atmosphere, oceans and, space all lie within the province of the geophysicist. To work effectively in so broad an area requires considerable depth and breadth of understanding of physical principles and considerable proficiency in mathematics. Thorough undergraduate training in an Earth or physical science is ordinarily regarded as a necessary prerequisite for advanced study.

An intensive two-year program of study at the master's level is available for students who wish to enter the environmental or energy industries. The PhD should be considered the teaching and research degree. The curriculum is intended for students with an undergraduate degree in geology or geophysics or with extensive exposure to geoscience concepts through academic training and/or experience. The course sequencing and the subject sequence in each course is carefully designed to use previously acquired knowledge optimally, and to provide experience in applying fundamental concepts in different contexts and in integrating geological, physical, mathematical, computer, and statistical skills in the solution of practical problems. The MS degree requires a thesis and specified coursework. For students interested in careers in energy fields, the MS curriculum pools the resources of the Departments of Geology and Geophysics and Petroleum Engineering in a manner designed to better prepare students than conventional offerings in the separate disciplines.

Current geophysical research areas within the department include studies in theoretical and model seismology focusing on the internal structure of the earth, earthquake mechanisms and seismic exploration; studies of the anisotropy and anelastic properties of sedimentary rocks and application to exploration; regional and global seismology; studies in experimental rock deformation focusing on the failure strength of rocks, friction in rocks; mechanics of fault development; fluid-flow properties of faults and dynamics of faulted reservoirs; marine studies of the structure of the oceanic crust and continental margins; the analysis of magnetic and gravity anomalies and application to exploration and global geophysics; convection in the mantle and global tectonics; vertical seismic profiling; and attenuation of seismic waves.

Members of the department also are involved in geophysical investigations of the sea floor through the Integrated Ocean Drilling Program. These investigations include mineral properties, heat flow, borehole logging, and other aspects of marine geophysics.

The department has an extensive computer network of workstations, computer servers, and storage for data processing, imaging, and modeling. The Texas A&M Supercomputing Facility is available to students and faculty for computer-intensive applications. The department has field exploration equipment for gravity, ground-penetrating radar, seismic reflection/refraction, and electromagnetic surveys. More details can be found at <http://geoweb.tamu.edu/> under Research Facilities.

Graduate Certificate in Petroleum Geoscience

The Graduate Certificate in Petroleum Geoscience is an interdisciplinary program in the Department of Geology and Geophysics designed to enhance both critical thinking and the technical skills that serve as the

scientific foundation for practicing petroleum geoscience. The program requires a minimum of 18 semester credit hours from Geology and Geophysics and optionally Petroleum Engineering as part of a regular graduate program.

Faculty

Bapst, David W, Instructional Assistant Professor
Geology & Geophysics
PHD, University of Chicago, 2013

Becker, Mauro R, Professor of the Practice
Geology & Geophysics
PHD, The University of Texas at Austin, 1996

Belanger, Christina L, Associate Professor
Geology & Geophysics
PHD, University of Chicago, IL, 2011

Benavides Iglesias, Alfonso, Lecturer
Geology & Geophysics
PHD, Texas A&M University, 2007

Chen, Xiaowei, Associate Professor
Geology & Geophysics
PHD, University of California, San Diego, 2013

Chester, Frederick M, Professor
Geology & Geophysics
PHD, Texas A&M University, 1988

Chester, Judith S, Professor
Geology & Geophysics
PHD, Texas A&M University, 1992

Donovan, Arthur D, Professor of the Practice
Geology & Geophysics
PHD, Colorado School of Mines, 1985

Duan, Benchun, Professor
Geology & Geophysics
PHD, University of California at Riverside, 2006

Everett, Mark E, Professor
Geology & Geophysics
PHD, University of Toronto, 1991

Grossman, Ethan L, Professor
Geology & Geophysics
PHD, University of Southern California, 1982

Kitajima, Hiroko, Associate Professor
Geology & Geophysics
PHD, Texas A&M University, 2010

Knappett, Peter S, Associate Professor
Geology & Geophysics
PHD, University of Tennessee at Knoxville, 2010

Kronenberg, Andreas K, Professor
Geology & Geophysics
PHD, Brown University, 1983

Lamb, William M, Professor
Geology & Geophysics
PHD, University of Wisconsin, Madison, 1987

Laya Pereira, Juan Carlos, Associate Professor
Geology & Geophysics
PHD, Durham University, United Kingdom, 2012

Lenz, Brandi, Instructional Assistant Professor
Geology & Geophysics
PHD, Ohio State University, 2021

Marcantonio, Franco, Professor
Geology & Geophysics
PHD, Columbia University, 1994

Miller, Brent V, Professor
Geology & Geophysics
PHD, Dalhousie University, Canada, 1997

Nana Yobo, Luscalors Lucien, Assistant Professor
Geology & Geophysics
PHD, University of Houston, 2021

Newman, Julie, Professor
Geology & Geophysics
PHD, University of Rochester, 1993

Perez, Nicholas D, Associate Professor
Geology & Geophysics
PHD, The University of Texas at Austin, 2015

Pope, Michael, Professor
Geology & Geophysics
PHD, Virginia Tech, 1995

Raymond, Anne L, Professor
Geology & Geophysics
PHD, University of Chicago, 1983

Reece, Julia S, Associate Professor
Geology & Geophysics
PHD, The University of Texas at Austin, 2011

Sun, Yuefeng, Professor
Geology & Geophysics
PHD, Columbia University, 1994

Zhan, Hongbin, Professor
Geology & Geophysics
PHD, University of Nevada, Reno, 1996

Zhang, Jin, Associate Professor
Geology & Geophysics
PHD, University of Illinois at Urbana-Champaign, 2014

Masters

- Master of Science in Geology (<http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/arts-and-sciences/geology-geophysics/geology-ms/>)
- Master of Science in Geophysics (<http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/arts-and-sciences/geology-geophysics/geophysics-ms/>)

Doctoral

- Doctor of Philosophy in Geology (<http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/arts-and-sciences/geology-geophysics/geology-phd/>)
- Doctor of Philosophy in Geophysics (<http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/arts-and-sciences/geology-geophysics/geophysics-phd/>)

Certificates

- Petroleum Geoscience Certificate (<http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/arts-and-sciences/geology-geophysics/petroleum-geoscience-certificate/>)