Department of Geosciences
Middle Tennessee State University
https://www.mtsu.edu/geosciences

MIDDLE TENNESSEE STATE UNIVERSITY

College of Basic and Applied Sciences

MTSU Geosciences

21st Century Solutions for a 46 Million Centuries-old Planet

Geosciences concern the Earth's entire physical makeup and the history of the physical and biological events that occurred within and upon it over the past four and a half billion years. Geoscientists are curious about the whole Earth, from its ancient past to its present and future, and they use the tools of chemistry, physics, biology, mathematics and other sciences to study the Earth.

At MTSU, students choose between three programs for the Bachelor of Science degree: **Geology, Physical Geography, and Environmental Science.**

The **Geology Concentration** focuses on the traditional areas of geology and Earth Science, including mineralogy and petrology, sedimentation and stratigraphy, paleontology, structural geology, oceanography, meteorology and field studies. Within the Geology concentration, students can specialize in one of the following three areas:

Geology – A rigorous program of study designed to prepare students for graduate studies in geology and for careers as professional geologists.

Earth Science – A program of study focused on the solid Earth, the atmosphere and the oceans, designed for students who wish to apply their knowledge of the Earth to a broad range of professional disciplines, such as environmental consulting and environmental law.

Earth Science for Teachers – A program of study designed to prepare students for careers as secondary education Earth Science teachers.

The **Physical Geography Concentration** focuses on the study of distributions, patterns, and movements across physical space. Physical geographers focus on the geography of naturally occurring physical processes and their effects, such as the geography of weather and climate. Within the Physical Geography concentration, students specialize in one of the following two areas:

Physical Geography – A program of study in which students examine interactions between the geosphere, the hydrosphere, and the atmosphere. Students in this career path take select courses in geology, geographic techniques (such as geographic information systems and remote sensing), other natural sciences, mathematics, business and the social sciences.

Geospatial Analysis – A program of study in which students develop Geographic Information Systems, Remote Sensing, and spatial analysis skills that are crucial for today's society and have many uses ranging from emergency management, business location and retail analysis, transportation modeling, crime and disease mapping, and natural resource management.

In the **Environmental Science Concentration** students take a rigorous sequence of courses in geology, physical geography, biology, chemistry, and computer science in preparation for employment as environmental science professionals in both government and industry. This program also is excellent preparation for students wanting to continue into the MTSU graduate program following of their BS degree.

Pursuing Geosciences at MTSU

High school students should have a strong foundation in English, mathematics, science, social studies, and history. Students should always meet with the Geosciences advisor prior to registering for classes. Call 615-898-5087 for an advising appointment.

Co-Curricular Opportunities

MTSU offers many opportunities for students learn and grow outside the classroom. These range from internships to study abroad programs to student organizations. Internships place MTSU students in professional environments. Study abroad programs are offered in countries around the world. In addition, there are dozens of student organizations on campus to meet the interests of a diverse student population. Student organizations in Geosciences include a chapter of the National Earth Science Honor Society and the Geography Club. All of these experiences enable students to gain valuable work

experience, learn about cultures, and take on leadership roles before they enter the workforce or enter graduate school.

Career Prospects in Geology, Earth Science and Environmental Science

Professional geologists and Earth scientists work outdoors in the field and indoors in laboratories and offices. The field may be at sea, deep in the oceans, or on land in mountains, plains, deserts, or polar ice sheets. For some, it is all of the above. Laboratories and offices may be located at universities, corporations, or on federal, state, county, civic, or private premises. Sometimes, the lab is on the field site as well as indoors. Almost all geologists and Earth scientists identify and describe samples of the natural materials (soil or sediment, minerals or rocks, fossils or trace fossils, water or ice), which they collect, and study.

Sampling of Earth materials requires equipment, from a rock pick to a drilling rig, and final identification and description of these samples usually requires use of laboratory instruments including X-ray fluorescence, electron microscope, seismograph, ground penetrating radar, polarizing optical microscope, mass spectrometer, geographical information system, lots of specialized software, and always, a personal computer. Some geologists and Earth scientists monitor drilling and take samples from deep boreholes. Some dredge samples from the deep oceans. Some sample landfills. Some design equipment to sample gas and dust from the outer limits of the atmosphere or obtain ice cores from high elevation glaciers. They all study samples of the Earth, and many travel to Antarctica. One Earth scientist has even been to the moon.

According to a U.S. Bureau of Labor Statistics, the average 2018 salary of a geosciences professional in the United States is $91,000 annually. Additionally, the number of U.S. geosciences jobs is expected to grow by at least 14% over the next ten years.

Career Prospects in Physical Geography

The ability of physical geography graduates to analyze and to integrate various aspects of the Earth's physical environments makes them attractive candidates for positions with planning and development agencies at the federal, state, and local levels. Retail chains, financial institutions, insurance companies, real estate and industrial firms employ geographers to collect and analyze data that relate to the firm's production and distribution of goods and services, or they may employ geographers to identify appropriate locations for new or expanded facilities.

Graduates from the Physical Geography specialization have a variety of career options including working for environmental and protection agencies, state departments of natural resources and conservation, and for a range of non-profit agencies working both in the United States and overseas in areas of environmental protection, development, and the protection of indigenous ways of life.

For graduates of the Geographic Techniques specialization with training in computer-based cartography, remote sensing, and the use of geographic information systems, there are numerous high-paying jobs with private companies and governmental agencies. This is a major growth area in all areas of the professional geosciences, as well as environmental management, emergency management, natural resource management, and regional planning.

Department Faculty and Staff

Jeremy Aber, PhD	Geographic Information Systems (GIS), Cartography
Mark Abolins, PhD	Structural and Field Geology
Alan Brown, MS	Earth Science
Joe Collins, PhD	Geomorphology
Laura Collins, MS	Earth Science
Warner Cribb, PhD	Mineralogy, Petrology, and Geochemistry
Racha El Kadiri, PhD	Hydrology, Remote Sensing, and Hazards
Clay Harris, PhD	Sedimentology and Oceanography
Alisa Hass, PhD	Climatology Biometeorology, Heatwaves, Climate Change
Zada Law, MS	Geographic Information Systems, Historical Geography
Melissa Lobegeier, PhD	Historical Geology, Paleontology
Henrique Momm, PhD	Geoinformatics and Watershed Physical Processes

For more information, contact:

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