

GEOSCIENCES

B.S., M.S., Ph.D. Degrees, Minors

College of Natural Science and Mathematics

Department of Geosciences (<https://www.uaf.edu/geosciences/>)
907-474-7565

B.S., GEOSCIENCE

Graduates in geoscience have broad backgrounds in the earth sciences and firm foundations in mathematics, physics and chemistry. Four concentrations are available to allow students to pursue their own emphasis:

- geology
- paleontology
- geospatial science
- geophysics

The concentrations allow students to focus early in their studies but are flexible enough to allow students to pursue their own interests in their junior and senior years. All the concentrations prepare students for industry jobs in oil, mining and environmental consulting; jobs with agencies such as the U.S. Geological Survey, NASA, the Alaska Division of Geological and Geophysical Surveys; or graduate studies.

The geology concentration offers students a sound background in a spectrum of geological disciplines with an emphasis on current field mapping techniques essential to exploration and research. The paleontology concentration is designed to provide students with the skills necessary to locate, excavate, interpret and curate specimens for museums, agencies or universities. The geospatial sciences concentration focuses on the principles, techniques and applications of remote sensing, GIS and GPS to prepare students for careers that require geospatial data analysis and visualization. The geophysics concentration challenges students to use physics in understanding geoscience concepts, emphasizing applications in seismology, volcanology and glaciology in the context of the Alaska landscape. This concentration prepares students for graduate work in geophysics and environmental engineering fields or other disciplines that use geophysical tools such as ground-penetrating radar or exploration seismology.

Minimum Requirements for Geoscience Bachelor's Degree: 120 credits

Learn more about the bachelor's degree in geoscience (<https://uaf.edu/academics/programs/bachelors/geoscience.php>), including an overview of the program, career opportunities and more.

M.S., PH.D., EARTH SYSTEM SCIENCE

Earth System Science at UAF is a multidisciplinary degree program that provides the option for a disciplinary concentration in one of eight topics:

- Sustainability
- Ecosystems
- Hydrology
- Atmospheric and Climate Sciences
- Cryosphere
- Solid Earth Geophysics

- Geoscience
- Geospatial Science

The ESS program involves faculty participation from six departments and programs:

- Natural Resources and Environment
- Center for Cross-Cultural Studies
- Biology and Wildlife
- Civil, Geological, and Environmental Engineering
- Atmospheric Sciences
- Geosciences

and five research institutes:

- Institute of Agriculture/Natural Resources and Extension
- Institute of Arctic Biology
- Institute of Northern Engineering
- International Arctic Research Center
- Geophysical Institute.

Minimum Requirements for Earth System Science Degrees: M.S.: 30 credits; Ph.D.: 26-41 credits.

M.S., PH.D., GEOPHYSICS

The geophysics program at UAF is closely connected with the Geophysical Institute and is optimally positioned to investigate a wide array of geophysical phenomena. Students have the option to obtain a general geophysics degree or to choose one of three concentrations to focus their studies.

Upon graduation, a student is expected to be able to:

1. address geophysical problems using the principles of conservation of energy, mass and momentum using both physical and mathematical concepts, particularly with respect to mathematical techniques such as linear algebra, vector calculus and partial differential equations;
2. explain physical processes underlying the Earth's global-scale features, including plate tectonics and the gravitational and magnetic fields;
3. describe common geophysical problems and assess the advantages and disadvantages of various theoretical, modeling or observational approaches to solving them, including identifying key assumptions underlying each approach;
4. frame well-defined scientific research questions and apply modern computational methods and observational techniques necessary to conduct the research;
5. publish and present results in peer-reviewed articles, scientific reports, and at national and international scientific meetings using oral and written skills developed through regular faculty feedback.

Minimum Requirements for Geophysics Degrees: M.S.: 30 credits; Ph.D.: 18 thesis credits

M.S., PH.D., GEOSCIENCE

Graduates in geoscience have broad backgrounds in Earth sciences or geography. There are concentrations available in geology and geography,

and requirements are flexible enough to allow students to customize the curriculum.

There are about 40 professional geoscientists in residence on campus, and graduate students normally participate in the ongoing research of these professionals. Teaching and research assistantships are available to graduate students in many of these areas.

Minimum Requirements for Geoscience Degrees: M.S.: 30 credits; Ph.D.: 18 thesis credits

Programs

Degrees

- B.S., Geoscience (<https://catalog.uaf.edu/bachelors/geoscience-bs/>)
- M.S., Earth System Science (<https://catalog.uaf.edu/masters/earth-system-science/>)
- M.S., Geophysics (<https://catalog.uaf.edu/masters/geophysics/>)
- M.S., Geoscience (<https://catalog.uaf.edu/masters/geoscience/>)
- Ph.D., Earth System Science (<https://catalog.uaf.edu/phd/earth-system-science/>)
- Ph.D., Geophysics (<https://catalog.uaf.edu/phd/geophysics/>)
- Ph.D., Geoscience (<https://catalog.uaf.edu/phd/geoscience/>)

Minors

- Minor, Geology (<https://catalog.uaf.edu/minors/geology/>)
- Minor, Geophysics (<https://catalog.uaf.edu/minors/geophysics/>)
- Minor, Geospatial Sciences (<https://catalog.uaf.edu/minors/geospatial-sciences/>)
- Minor, Paleontology (<https://catalog.uaf.edu/minors/paleontology/>)