Twin Cities Campus

Earth Sciences Minor

Department of Earth Sciences

College of Science and Engineering

Link to a list of faculty for this program.

Contact Information:
Department of Earth and Environmental Sciences, University of Minnesota, John T. Tate Hall-Suite 150, 116 Church St. SE, Minneapolis, MN 55455 (612-624-1333; fax: 612-625-3819)
Email: esci@umn.edu
Website: http://www.esci.umn.edu/programs/graduate

- Program Type: Graduate minor related to major
- Requirements for this program are current for Spring 2022
- Length of program in credits (Masters): 6
- Length of program in credits (Doctorate): 12
- This program does not require summer semesters for timely completion.

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

The modern earth sciences are a remarkable synthesis of the physical and biological sciences. They are at the forefront of inquiry into and solutions of most of the major issues involving the global environment: climate, oceans, freshwater in all its forms, natural resources, and natural disasters. Like no other field, they integrate all the systems, from surface to great depth, from physics to chemistry to biology, and over all of geologic time and all geographic scales. The program includes the fields of structural geology, tectonics, petrology, hydrogeology, geomorphology, sedimentology, surface processes, geochemistry, geobiochemistry, geobiology, paleontology and paleobiology, chemical oceanography, mineralogy, mineral and rock magnetism, rock and mineral physics, geodynamics, seismology, geostatistics, planetary geology, and geophysics and applied geophysics.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission

Special Application Requirements:
Students interested in the minor are strongly encouraged to confer with their major field advisor and director of graduate studies, and the Earth Sciences director of graduate studies regarding feasibility and requirements.

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements

Use of 4xxx courses toward program requirements is permitted under certain conditions with adviser approval.

Courses offered on both the A-F and S/N grading basis must be taken A-F.

The minimum cumulative GPA for the minor is 3.00.

Minor Courses (6 to 12 credits)

Masters students select 6 credits, and doctoral students select 12 credits from the following in consultation with the Earth Sciences director of graduate studies. Other courses may be chosen with the approval of the Earth Sciences director of graduate studies.

ESCI 4203 - Environmental Geophysics (3.0 cr)
ESCI 4204 - Geomagnetism and Paleomagnetism (3.0 cr)
ESCI 4211 *{Inactive}*(3.0 cr)
ESCI 4212 - Geodynamics (3.0 cr)
ESCI 4401 - Aqueous Environmental Geochemistry (3.0 cr)
ESCI 4402 - Biogeochemical Cycles in the Ocean (3.0 cr)

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ESCI 4501 - Structural Geology (3.0 cr)
ESCI 4502 - Tectonic Styles (3.0 cr)
ESCI 4602 - Sedimentology and Stratigraphy (3.0 cr)
ESCI 4701 - Geomorphology (4.0 cr)
ESCI 4702 - General Hydrogeology (4.0 cr)
ESCI 4703 - Glacial Geology (4.0 cr)
ESCI 4801 - Geomicrobiology (3.0 cr)
ESCI 4911 - Advanced Field Geology (4.0 cr)
ESCI 5093 *{Inactive}*(1.0 - 4.0 cr)
ESCI 5102 - Climate Change and Human History (3.0 cr)
ESCI 5201 - Time-Series Analysis of Geological Phenomena (3.0 cr)
ESCI 5203 - Mineral and Rock Physics (3.0 cr)
ESCI 5204 - Geostatistics and Inverse Theory (3.0 cr)
ESCI 5302 - Isotope Geology (3.0 cr)
ESCI 5351 *{Inactive}*(3.0 cr)
ESCI 5353 - Electron Microprobe Theory and Practice (3.0 cr)
ESCI 5402 - Science and Politics of Global Warming (3.0 cr)
ESCI 5403 - Computer Applications in Earth & Environmental Sciences (3.0 cr)
ESCI 5503 - Advanced Petrology (3.0 cr)
ESCI 5705 - Limnogeology and Paleoenvironment (3.0 cr)
ESCI 5805 - Standards and Practices for Professional Geoscienists (3.0 cr)
ESCI 5971 - Field Hydrogeology (2.0 cr)
ESCI 5980 - Seminar: Current Topics in Earth Sciences (1.0 - 4.0 cr)
ESCI 8203 - Environmental Geophysics (3.0 cr)
ESCI 8204 - Geomagnetism and Paleomagnetism (3.0 cr)
ESCI 8243 - Principles of Rock Magnetism (1.0 - 3.0 cr)
ESCI 8353 - Phase Equilibrium in Mineral Systems (3.0 cr)
ESCI 8354 - Igneous Petrology (3.0 cr)
ESCI 8355 - Metamorphic Petrology (3.0 cr)
ESCI 8401 - Aqueous Environmental Geochemistry (3.0 cr)
ESCI 8402 - Biogeochemical Cycles in the Ocean (3.0 cr)
ESCI 8501 - Structural Geology (4.0 cr)
ESCI 8502 - Tectonic Styles (3.0 cr)
ESCI 8511 - Mechanics of Sediment Transport (3.0 cr)
ESCI 8601 - Introduction to Stream Restoration (3.0 cr)
ESCI 8602 - Stream Restoration Practice (2.0 cr)
ESCI 8701 - Geomorphology (4.0 cr)
ESCI 8712 - Transport Phenomena and Analytical Geohydrology (3.0 - 4.0 cr)
ESCI 8718 - Numerical Methods in Hydrogeology (4.0 cr)
ESCI 8801 *{Inactive}*(3.0 cr)
ESCI 8970 - Seminar: Current Topics in Earth Sciences (1.0 - 4.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans.
Students may not complete the program with more than one sub-plan.

Masters

Doctoral