Twin Cities Campus

Environmental Geosciences Minor

CLA Dean's Office

College of Liberal Arts

- Program Type: Undergraduate minor related to major
- Requirements for this program are current for Fall 2018
- Required credits in this minor: 17 to 18

Environmental geoscience is the study of processes within, and interactions between, the atmosphere, ocean and the solid Earth that determine the habitability of the planet. In short, it is the branch of geology that is concerned with the interactions between humans and the geologic environment. The subject covers natural processes that have been modifying the planet over its entire history, but with a strong focus on understanding the modern system and how it has been affected by human activities. Students earning a Minor in Environmental Geoscience will develop key observational and analytical skills that enable them to address fundamental questions about the functioning of Earth systems, especially in relation to climate change, hydrology and water resources, and mineral resources. Students will cover core topics in Earth Science that address topics such as, (1) the drivers of climate change in the Earths past and how will these processes may change in the future, (2) the frequency and setting of natural hazards relevant to modern society (e.g., floods, tsunamis, earthquakes, and weather-related phenomena), (3) the impacts of changing nutrient cycling and pollution on the sustainability of freshwater and marine ecosystems, and (4) the effects of the use of energy and materials resources to ensure continued functioning of modern society.

This minor is well suited to those interested in environmental science and policy, who are looking to acquire a foundation in the geologic processes that govern water, soil, and natural resource development. Students will also gain a range of transferable skills, including: written and oral reports; critical analysis and interpretation of data; and group working.

Program Delivery

This program is available:

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

Minor Requirements

Preparatory Courses

Take exactly 1 course(s) totaling 3 - 4 credit(s) from the following:

- ESCI 1001 - Earth and Its Environments [PHYS, ENV] (4.0 cr)
- ESCI 1003 - Dinosaurs and Our World [BIOL, ENV] (4.0 cr)
- ESCI 1005 - Geology and Cinema [PHYS, ENV] (4.0 cr)
- ESCI 1006 - Oceanography [PHYS, ENV] (4.0 cr)
- ESCI 1007 - From Microbes to Mammoths: History of Life on Earth [BIOL] (4.0 cr)
- ESCI 1012 - Natural Disasters [TS] (3.0 cr)

Electives

Students choose electives in consultation with the Earth Sciences director of undergraduate studies/advisor.

Take 14 or more credit(s) from the following:

- ESCI 2201 - Solid Earth Dynamics (4.0 cr)
- ESCI 2202 - Earth History (4.0 cr)
- ESCI 2203 - Earth Surface Dynamics (4.0 cr)
- ESCI 2301 - Mineralogy (3.0 cr)
- ESCI 2302 - Petrology (3.0 cr)
- ESCI 3004 - Water and Society [ENV] (3.0 cr)
- ESCI 3005 - Earth Resources (3.0 cr)
- ESCI 3006 - Rocks and Stars: Introduction to Planetary Science (3.0 cr)
- ESCI 3202 - Fluid Earth Dynamics (4.0 cr)
- ESCI 3303W - Geochemical Principles [WI] (4.0 cr)
- ESCI 3402 - Science and Politics of Global Warming [ENV] (3.0 cr)
- ESCI 4102W - Vertebrate Paleontology: Evolutionary History and Fossil Records of Vertebrates [WI] (3.0 cr)
- ESCI 4103W - Fossil Record of Mammals [WI] (3.0 cr)
- 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)

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- ESCI 4402 - Biogeochemical Cycles in the Ocean (3.0 cr)
- 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 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 5205 *{Inactive}*(3.0 cr)
- ESCI 5302 - Isotope Geology (3.0 cr)
- ESCI 5351 *{Inactive}*(3.0 cr)
- ESCI 5502 *{Inactive}*(3.0 cr)
- ESCI 5503 - Advanced Petrology (3.0 cr)
- ESCI 5601W *{Inactive}*[WI] (4.0 cr)
- ESCI 5705 - Limnogeology and Paleoenvironment (3.0 cr)
- ESCI 3002 - Climate Change and Human History [ENV] (3.0 cr)
  or ESCI 5102 - Climate Change and Human History (3.0 cr)
- ESCI 4503 *{Inactive}*(3.0 cr)
  or ESCI 5504W *{Inactive}*[WI] (3.0 cr)
- **Elective with departmental advisor permission only**

  Students may substitute one of the following courses as a minor course with prior approval from the Earth Sciences departmental advisor. This is not an exhaustive list, see department advisor for approval of other courses.

  Take 0 or more course(s) from the following:
  - ANTH 3041 *{Inactive}*(3.0 cr)
  - APEC 3611W - Environmental and Natural Resource Economics [ENV, WI] (3.0 cr)
  - ESCI 4701 - Geomorphology (4.0 cr)
  - GLOS 4305 *{Inactive}*[ENV] (3.0 cr)
    or SOC 4305 - Environment & Society: An Enduring Conflict [ENV] (3.0 cr)

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