

Duluth Campus

Geological Sciences B.S.

D Earth & Environmental Sci

Swenson College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2019
- Required credits to graduate with this degree: 120
- Required credits within the major: 93 to 98
- This program requires summer terms.
- Degree: Bachelor of Science

The study of geology provides ways of understanding and appreciating dynamic earth processes, our physical environment, and our place in the long and complex history of the planet and solar system. It is by nature interdisciplinary and attracts students with broad interest in earth science, archaeology, astronomy, biology, chemistry, engineering, environmental science, applied mathematics, oceanography, limnology and/or physics. The BS degree in geological sciences can lead to rewarding careers in industry, government, conservation, law, business, and academia. Geology requires a solid base of knowledge in related sciences (chemistry and physics) and mathematics, as well as a solid core of geology courses. A summer course in field mapping is also required. Honors requirements: To attain department honors, students must undertake an independent research project and maintain a cumulative overall GPA of 3.00. The research can be part of a UROP, directed research, independent study, or an internship with a faculty member. Students must either make a brief oral presentation to the department summarizing their results and produce a research paper (minimum 10 pages) OR give an oral or poster presentation of their research results at a regional or national meeting (e.g., GSA, AGU, ILSG, or similar campus event).

Program Delivery

This program is available:

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

Admission Requirements

For information about University of Minnesota admission requirements, visit the [Office of Admissions website](#).

General Requirements

The Board of Regents, on recommendation of the faculty, grants degrees from the University of Minnesota. Requirements for an undergraduate degree from University of Minnesota Duluth include the following:

1. Students must meet all course and credit requirements of the departments and colleges or schools in which they are enrolled including an advanced writing course. Students seeking two degrees must fulfill the requirements of both degrees. However, two degrees cannot be awarded for the same major.
2. Students must complete all requirements of the [Liberal Education Program](#).
3. Students must complete a minimum of 120 semester credits.
4. At least 30 of the last 60 degree credits earned immediately before graduation must be awarded by UMD.
5. Students must complete at least half of their courses at the 3xxx-level and higher at UMD. Study-abroad credits earned through courses taught by UM faculty and at institutions with which UMD has international exchange programs may be used to fulfill this requirement.
6. If a minor is required, students must take at least three upper division credits in their minor field from UMD.
7. The minimum cumulative UM GPA required for graduation will be 2.00 and will include only University of Minnesota coursework. A minimum UM GPA of 2.00 is required in each UMD undergraduate major and minor. No academic unit may impose higher grade point standards to graduate.

8. Diploma, transcripts, and certification will be withheld until all financial obligations to the University have been met.

Program Requirements

Required Geology Core (42-43 cr)

Core Courses (14 - 15 cr)

[GEOL 1110](#) - Geology and Earth Systems [LE CAT4, NAT SCI, SUSTAIN] (4.0 cr)

or [GEOL 1610](#) - Oceanography [LE CAT5, NAT SCI, SUSTAIN] (3.0 cr)

or [GEOG 1414](#) - Physical Geography [LE CAT4, NAT SCI, SUSTAIN] (4.0 cr)

[ESCI 2010](#) - Surface Processes (4.0 cr)

[GEOL 2110](#) - Earth History (4.0 cr)

[GEOL 2120](#) - The Earth's Dynamic Interior (3.0 cr)

Advanced Core Courses (28 cr)

[GEOL 2311](#) - Mineralogy (4.0 cr)

[GEOL 2312](#) - Petrology (5.0 cr)

[GEOL 3420](#) - Sedimentology and Stratigraphy (4.0 cr)

[GEOL 3800](#) - Principles of Geophysics (4.0 cr)

[GEOL 4450](#) - Structural Geology (5.0 cr)

[GEOL 4500](#) - Field Geology (6.0 cr)

Courses Required From Other Programs (33 cr)

Mathematics

Calculus I

[MATH 1290](#) - Calculus for the Natural Sciences [LE CAT2, LOGIC & QR] (5.0 cr)

or [MATH 1296](#) - Calculus I [LE CAT2, LOGIC & QR] (5.0 cr)

Calculus II

[MATH 1297](#) - Calculus II [LOGIC & QR] (5.0 cr)

Physics

Introduction to Physics I and II

[PHYS 1001](#) - Introduction to Physics I [LE CAT4, NAT SCI] (5.0 cr)

[PHYS 1002](#) - Introduction to Physics II (5.0 cr)

or General Physics I and II with labs

[PHYS 2013](#) - General Physics I [LE CAT5, NAT SCI] (4.0 cr)

or [PHYS 2017](#) - Honors: General Physics I [NAT SCI] (4.0 cr)

[PHYS 2014](#) - General Physics Lab I [NAT SCI] (1.0 cr)

[PHYS 2015](#) - General Physics II (4.0 cr)

or [PHYS 2018](#) - Honors General Physics II (4.0 cr)

[PHYS 2016](#) - General Physics Lab II (1.0 cr)

Chemistry I and II with labs

[CHEM 1153](#) - General Chemistry I [LE CAT5, NAT SCI] (4.0 cr)

[CHEM 1154](#) - General Chemistry Lab I [LE CAT4, NAT SCI] (1.0 cr)

[CHEM 1155](#) - General Chemistry II (4.0 cr)

[CHEM 1156](#) - General Chemistry Lab II (1.0 cr)

Advanced Writing

[WRIT 3150](#) - Advanced Writing: Science (3.0 cr)

Advanced Electives (18 cr)

Earth Science Electives

Take 9 or more credit(s) from the following:

- [ESCI 3xxx](#)
- [ESCI 4xxx](#)
- [ESCI 5xxx](#)
- [GEOL 3xxx](#)
- [GEOL 4xxx](#)
- [GEOL 5xxx](#)

Additional Electives

At least one course totally at least one credit must have a designator that is not ESCI or GEOL.

Take 9 or more credit(s) from the following:

- [AST 4110](#) - Observational Astronomy (3.0 cr)
- [BIOL 3xxx](#)
- [BIOL 4xxx](#)
- [BIOL 5xxx](#)

- CHEM 3xxx
- CHEM 4xxx
- CHEM 5xxx
- CS 3xxx
- CS 4xxx
- CS 5xxx
- ESCI 3xxx
- ESCI 4xxx
- ESCI 5xxx
- [GEOG 3401](#) - Weather and Climate (3.0 cr)
- [GEOG 4401](#) - Climate Science (3.0 cr)
- [GEOG 4451](#) - The Geography of Soils (4.0 cr)
- [GEOG 4446](#) - Water Processes and Management (3.0 cr)
- GEOL 3xxx
- GEOL 4xxx
- GEOL 5xxx
- GIS 3xxx
- GIS 4xxx
- GIS 5xxx
- LIM 5xxx
- MATH 3xxx
- MATH 4xxx
- MATH 5xxx
- PHYS 3xxx
- PHYS 4xxx
- PHYS 5xxx
- STAT 3xxx
- STAT 4xxx
- STAT 5xxx
- [WRS 5101](#) - Water Policy (3.0 cr)