

New Academic Program: B.S. in Geology

BACKGROUND

Program Proposed Start Date

Fall 2021

Program Description

This proposal is to create a new Bachelor of Science (B.S.) degree in Geology to replace the Geology Option under OSU's existing B.S. degree in Earth Sciences. The Earth Sciences B.S. currently has three options: Climate Science, Geology, and Ocean Science. New B.S. degrees to replace the Climate Science and Ocean Science options will be proposed separately.

The B.S. degree in Geology is a four-year degree that prepares students to understand the Earth, from its composition and internal structure to its history and the processes that shape its surface. Based on historical existing strengths within the College of Earth, Ocean, and Atmospheric Sciences (CEOAS) in the areas of earth materials, surficial processes, earth dynamics and field techniques, the program provides a broad, high-quality curriculum that will prepare students for careers in applied geology, environmental geosciences, science education, and research, or the pursuit of a graduate degree. Experiential learning lies at the core of a geologist's education in CEOAS and practical experiences are integrated throughout the curriculum. This program takes advantage of OSU's world-class faculty for undergraduate teaching and advising and state-of-the-art research infrastructure in the geosciences, and it provides an opportunity to attract motivated students to a signature program that trains future geoscience leaders.

Program Context

The primary justification for replacing an "Earth Sciences" option with a standalone B.S. in Geology is name recognition as the current Geology Option curriculum and program structure more closely aligns with degrees called "geology" rather than "earth sciences." Earth Science is a broad field of study encompassing the Earth as an entire system that incorporates the understanding of the water and rock cycles, atmosphere, and the environment in general. Geology, on the other hand, is the study of the Earth's physical formations and understanding how and why they exist. The activities of the program faculty and the training they offer are more accurately reflected by "geology" rather than "earth sciences." The geology program has distinct academic and career pathways founded on its particular curriculum, and the program is viewed by other colleges as a geology program rather than an earth science program. Lastly, this program has a long history of being known as a geology program, and many alumni and past-employees have a strong attachment to the historical label. Therefore, the intention is to reclaim the geology name identity formally, such that student, alumni and employer recognition is enhanced.

The Geology major requires credits in seven categories: 48 credits in the baccalaureate core; 34-37 credits of basic science and math; 4 credits of additional skills courses; 12 credits of geology foundation courses; 49 credits of geology core courses; 12-16 credits of geology elective specialization courses; and 14-21 credits of general elective courses (depends on the number of baccalaureate core electives that will also meet requirements of the major).

The university baccalaureate core course (BCC) requirement is met with 48 credits and a writing intensive course (WIC). The geology student satisfies the general education requirement by selecting 27 unrestricted credits from the general list of approved courses and 21 credits from a restrictive list of BCC courses, which simultaneously satisfy requirements for the Geology major. The WIC and Synthesis courses required as part of the BCC are satisfied by courses taken as part of the geology core curriculum.

The proposed B.S. in Geology will be offered on OSU's Corvallis campus. The "Basic Mathematics and Science Foundation" courses (mathematics, physics, chemistry, and statistics) are taught multiple quarters during the academic year. The Geology electives include many options in the subfields of Solid Earth, Natural Hazards, and Earth Surface, so students will be able to find electives that fit in their schedules.

The proposed B.S. in Geology will largely follow existing modes of delivery, which emphasize active learning, such as traditional classroom lectures, often enhanced through the use of digital audiovisual facilities including digital projection and audiovisual devices, laboratories and recitations, where students will gain "hands-on" experience with techniques and problem solving, in both individual and group settings, and through the long-standing focus in geology-related curricula for experiential learning where students are exposed to geological problems in a real-world context. This approach promotes active learning and provides a key context for material learned from other sources. This includes field trips as integral components of courses of all levels, as well as designated field courses.

Program Purpose/Relationship to University Mission and Strategic Plan

The B.S. in Geology directly addresses Goal 1, the three signature areas of distinction, and Goal 2 in OSU's strategic plan. Geology graduates will be prepared to address a wide range of issues associated with natural resources, surficial processes, and natural hazards associated with our changing planet and the needs of the people living on it. Additionally, Geology is by nature an experiential learning science, and the experiences that students will encounter during their education will involve them in cutting edge research or relevant internships during their time at OSU.

OSU's highly skilled and nationally and internationally recognized geology faculty address Goal 2 of OSU's Strategic Plan by providing a distinctive curriculum and incorporating innovative pedagogy and active learning throughout the curriculum, including immersive experiential learning in courses, research projects, theses or internships. Geology faculty members are nationally and internationally recognized teachers and researchers.

Need for the Program

The B.S. in Geology degree program will contribute to improved educational attainment in Oregon and the Pacific Northwest. The study of geology offers an opportunity to understand earth materials, the processes shaping those materials, and human's place on the earth. Geology students become adept at placing those skills into a broader perspective and begin understanding broader connections and the scientific process. Additionally, students often use real-world data in geology courses that help them develop quantitative skills, presentation skills, and a motivation for understanding how geology affects their lives.

Geology plays a crucial role in Oregon's social, economic, and environmental systems.

Graduates of the program will be prepared to address these challenges and pursue opportunities for solutions (e.g., ore petrology, volcanic and earthquake understanding and hazard mitigation). The program will have positive economic and environmental impacts on the Pacific Northwest, which resides in an active and geologically diverse zone. Additionally, baccalaureate core courses offered to the broader OSU community will provide students with knowledge and skills relevant to their own fields.

The B.S. in Geology degree prepares students for civic and cultural contributions on several levels. The knowledge and training gained through the geology program help students to understand geological issues on local, state, national and global levels. This understanding allows the student to assess geological issues and respond from the level as an informed voter or, for students advancing to higher degrees, as a researcher or educator. In all cases, the Geology program will prepare students for the demands and responsibilities of citizenship.

Program Financials

Geology is an existing degree option within the Earth Science degree, thus no budgetary impact is expected from elevating this degree option to a stand-alone degree. However, it is expected that marketing the degree as a B.S. in Geology will increase student recruitment by promoting visibility of the degree program.

The Geology Option currently has 94 students eligible to enroll (AY 2019-20). Historically, over the last few decades, the student enrollment has been in the 90s with short term fluctuations that increase and decrease depending on year. Historically, the number of students graduating from the Earth Science Geology Option degree on a yearly basis has averaged 15 students/year over the last 5 years. However, the Geology faculty have developed an Action Plan utilizing various measures to increase student enrollment by 2-3/year over 5 years.

RECOMMENDATION

All appropriate university committees and the OSU Faculty Senate have positively reviewed the proposed program. The proposal will be considered at the May 14 OSU Faculty Senate meeting. Contingent on approval at that meeting, the Provost recommends that the Academic Strategies Committee approve the establishment of a B.S. in Geology, effective in fall 2021, pending the support of the Statewide Provosts Council and the approval of the Higher Education Coordinating Commission.