

EARTH AND ENVIRONMENTAL SCIENCES

Mission Statement

In Earth and Environmental Sciences, we investigate the *Earth* and the *Environment*, understood in the broadest terms, from a *natural science perspective*. We seek to understand how they have evolved and continue to evolve, how Earth systems—including human agents—interact to produce the environment in which we live, and how present and future changes may impact the habitability of Earth. The central goal of the department is to educate students about the nature and history of the Earth, the processes that shape the Earth, and the impacts those processes have on humans, other organisms, and the environment.

An understanding of the Earth is an essential component of global citizenship. Humanity faces many critical environmental issues, including global climate change, water shortages, loss of arable land, natural hazards such as earthquakes and flooding, and the dwindling access to energy resources; furthermore, vulnerability to these issues is disproportionate across humanity. Citizens and professionals with training in the Earth and Environmental Sciences will contribute to addressing these and other problems, while increasing opportunities for humans to live sustainably and equitably on the Earth.

The Department of Earth and Environmental Sciences strives to foster an environment of inclusion and equity. Innovative, effective, and equitable stewardship of Earth's resources requires a diversity of perspectives and influences; we strive to empower a future generation of socially responsible scientific leaders who represent a cross-section of human society. We are committed to excellence in teaching and learning and affirm the value of our community members regardless of race, ethnicity, gender, social class, or sexual identity.

Broadly speaking, the Department of Earth and Environmental Sciences provides the tools to be successful in any field. Whether their goal is employment in the field or graduate school, EESC majors and minors develop a strong background in the Earth and Environmental Sciences. The department provides non-majors with a broad and deep knowledge of the Earth and its environment that will serve their needs as citizens and future community leaders.

Learning Goals

The Department of Earth and Environmental Sciences is committed to helping students become productive, informed, and influential citizens. To that end, we have developed a clear set of learning goals that reside within three broad categories:

Content Knowledge.—Mastery of modern disciplinary content is paramount in the EESC program. EESC faculty are committed to staying apprised of the most recent developments and best practices within our individual specialties. Therefore, EESC students will encounter up-to-date concepts and methods. EESC Faculty are also keenly aware of the importance of the allied foundational sciences (i.e., Biology, Chemistry, Mathematics, Computer Science, Data Analytics, and Physics). Accordingly, students are encouraged to learn deeply in the allied disciplines. Ultimately, we recognize that modern earth and environmental science is rooted in a broad understanding of foundational skills and core disciplinary knowledge. By the end of their EESC major, students will master the disciplinary knowledge needed to comprehend,

apply, analyze, synthesize, evaluate, and integrate new information into their ever-developing understanding of the earth and its environment.

Quantitative Literacy.—The ability to reason using numbers is an essential skill for any informed member of the citizenry. We believe students should be empowered, not intimidated, by data. That said, we recognize that interpreting data is not always a straightforward exercise. Accordingly, quantitative exercises are integrated into all levels of the EESC curriculum. These learning opportunities in EESC are designed to promote operational proficiency with data beyond college, even when confronted with incomplete and/or contradictory information. EESC graduates should be able to evaluate, analyze, and interpret quantitative information, not simply to find an answer but rather, to help interpret the earth and environment around them.

Communication.—The ability to communicate effectively is a core learning outcome of any undergraduate education. The Department of Earth and Environmental Sciences recognizes the importance of both oral communication skills (public speaking) and written communication (expository writing). Both skill sets are emphasized at all levels of the EESC curriculum. Upon the completion of an EESC major, students should be able to construct, apply, and evaluate effective oral and written communication strategies for both specialized and general audiences.

The Department of Earth and Environmental Science employs a comprehensive exam to evaluate student learning. This multi-day exam uses oral and written components to evaluate individual student mastery of core EESC knowledge. Special emphasis is placed on student performance with novel data sets. The comprehensive exam serves two important functions. First, it provides valuable feedback to the EESC faculty on teaching effectiveness across multiple dimensions of the curriculum. Second, in providing students with an experience similar to what they might expect on the job, or in graduate school, it provides a unique opportunity for self-evaluation. The comprehensive exam is administered early in the spring semester of a student's senior year. Successful completion of the EESC Comprehensive Exam is required from all EESC majors.