

STUDENT LEARNING OUTCOMES ASSESSMENT PLAN
B.S. IN ENVIRONMENTAL SYSTEMS SCIENCE AND SUSTAINABILITY
May 2018

Program Goals for Majors

The Environmental Systems Science and Sustainability (ESSS) major provides an interdisciplinary, and socially transformative academic program that prepares the new generation of environmental and sustainability scientists and citizens to address complex, global, and interlinked societal and environmental problems facing humanity, to improve quality of life. Graduates from this program will be our future's environmental leaders, systems thinkers, problem solvers, change agents, decision makers, and effective interdisciplinary communicators.

Student Learning Outcomes

Graduates of this program will be able to:

1. Understand and have strong command of fundamental physical/natural and human environment systems concepts;
2. Be able to integrate and analyze human-environment systems interactions from different domains;
3. Be able to conceptualize and negotiate environmental and sustainability values, principles, goals, and targets;
4. Be able to effectively enable, facilitate, and communicate environmental and sustainability research and problem solving;
5. Be able to link acquired knowledge of complex environmental systems to action and formulate potential sustainable solutions to environmental issues through constructing new knowledge via research and/or practice

Assessment Procedure

Given the highly interdisciplinary nature of this program two committees will be assembled to monitor the outcomes from student learning objectives:

Assessment Committee that will comprise of the Director of the ESSS program, and two additional core faculty members with interests in Assessment. These faculty members will be responsible for collecting and processing student learning outcome data each year, preparing summary reports, and sharing their recommendations for programmatic improvement with the Department Chair.

Program Advisory Board that will comprise of faculty members teaching core courses in the program, plus members of the Assessment Committee. This group will design the program content test and, as needed, respond to recommendations for actions to improve the program's performance in achieving relevant student learning outcomes.

Direct Assessment

Students will demonstrate fundamental competency in physical/natural and social sciences (Outcome 1) by completing a program content test administered in GEO 293.

In GEO 398.02, majors will produce a portfolio with the following artifacts:

- a) One research paper, written in an upper-level elective course, which integrates and analyzes interactions between human and environmental systems and formulate potential sustainable solutions to environmental problems (Outcomes 2, 4).
- b) Two ethical theory briefs completed in PHI236 (Outcome 3, 4). Students will complete the briefs by choosing a current environmental topic, and identify and critique the ethical theory that best supports its claim to being “sustainable,” “green,” or “environmentally friendly”.
- c) Reflection journal stemming from the program-approved internship or research experience focusing on the environment/sustainability (Outcome 5)

Faculty expectations for students' achievement

Each year, the ESSS Assessment Committee will assess student performance on the content test in six competency areas: (Outcome 1)

- a) Biological and ecological sciences
- b) Basic sciences including chemistry and physics
- c) Earth's history
- d) Global, social, and cultural awareness
- e) American political institutions, civic practices
- f) Economics

This exam will be a multiple-choice test with several questions from each of the six competency areas. These questions will be selected by members of the Program Advisory Board. The Assessment Committee will determine student performance in each of the areas and report the results to the Department Chair, who will communicate the report to the program faculty.

In even years, the committee will collect student portfolios assembled in GEO 398.02 and evaluate a sample of them. The committee will apply a rubric with a 1-5 scale to analyze performance in the Student Learning Outcomes as follows:

- a) Research Paper
 - Ability to conduct research (outcome 2)
 - Ability to summarize, synthesize and critique information (Outcome 1, 2, 5)
 - Ability to communicate environmental information (Outcome 4)
- b) Ethical Theory Briefs - Papers
 - Ability to identify the theoretical ethical underpinnings of current environmental issues (Outcome 3)
 - Ability to critique ethical environmental theory (Outcome 3)
 - Ability to communicate through appropriate writing style (Outcome 4)
- c) Internship or research experience including reflection journal
 - Search for, identify, and secure appropriate internship or research experience (Outcome 5)

- Conduct oneself in a professional manner in the workplace, and work in teams (evaluation completed by internship supervisor) (Outcome 5)
- Evaluate the reflection journal from internship/research experience that will detail reflections of day-to-day activities and discuss how the experience helped them build on and reinforce their academic skills, and help them transition beyond the undergraduate experience. Students will be assessed on their ability to link acquired knowledge through the program to action through constructing new knowledge and/or practical solutions towards environmental sustainability (Outcome 3, 4, 5)

The Assessment Committee will prepare a report of the results to the Department Chair, who will share it with the Program Advisory Board and other affiliated faculty members. This report will include recommendations for actions to improve the program's performance in achieving its student learning outcomes. These recommendations will be discussed by the faculty who will plan to develop actions for improvement, as needed.

Indirect Assessment

- a) *Current students:* Each year, the ESSS program will administer an exit survey to all majors in GEO 398 to ensure student satisfaction, the quality of the curriculum, instruction, and adequacy for career preparation.
- b) *Alumni:* Each year, the Assessment Committee will review results of the Assessment's Office Alumni Survey. Every five years, the Committee will gather additional, more extensive input from its alumni. The instructor of GEO 398 will maintain the contact information of all graduates and invite them to campus as part of the GEO 293 course to provide feedback to current students and faculty about preparation for the workforce and further study.
- c) *Employers:* Each year, the instructor of GEO 398 will communicate with potential employers for student internship placement and gauge the currency of the curriculum and general student preparation for the workforce. The instructor will prepare a report for the Assessment Committee, as needed, to communicate any needs for curriculum update/improvement.

The data stemming from the indirect assessment methods will be reviewed by the Assessment Committee every two years and summarized in a report to the Department Chair, who will share it with the Program Advisory Board members and other affiliated faculty. The report will include recommendations for actions to improve the program's performance in achieving the SLOs. These will be discussed by the Board faculty who will develop actions needed to improve the curriculum.