

2012-13 Undergraduate Academic Assessment Plan

Environmental
Engineering

College of Engineering

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Environmental Engineering, College of Engineering Undergraduate Academic Assessment Plan

Mission Statement

The Department of Environmental Engineering Sciences (EES) mission statement is as follows:

The mission of EES is to provide quality undergraduate and graduate educational programs in environmental engineering sciences, to conduct an internationally recognized environmental research program that will substantially contribute to the benefit of the earth, and to provide authoritative guidance to individuals and organizations charged with preventing and solving local, state, national and global environmental problems. EES serves as a leader in multi-department programs aimed at solving environmental problems and as a major on-campus crucible for conceptualization and solution of environmental problems.

The EES mission statement aligns with the College of Engineering mission statement:

The College of Engineering fosters and provides world-class programs in engineering education, research and service to enhance the economic and social well-being of the citizens of Florida, the nation and the world.

The EES mission statement aligns with the University of Florida mission statement, a portion of which is provided below:

The university welcomes the full exploration of its intellectual boundaries and supports its faculty and students in the creation of new knowledge and the pursuit of new ideas.

- *Teaching is a fundamental purpose of this university at both the undergraduate and graduate levels.*
- *Research and scholarship are integral to the educational process and to the expansion of our understanding of the natural world, the intellect and the senses.*
- *Service reflects the university's obligation to share the benefits of its research and knowledge for the public good. The university serves the nation's and the state's critical needs by contributing to a well-qualified and broadly diverse citizenry, leadership and workforce.*

Student Learning Outcomes (SLOs)

The Student Learning Outcomes (SLOs) for the Environmental Engineering B.S. program are as follows:

1. Apply knowledge of mathematics, science and engineering principles to environmental engineering problems.
2. Design and conduct environmental engineering experiments, as well as analyze and interpret the data.

3. Design an environmental engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability constraints.
4. Communicate technical data and design information effectively in writing and in speech to other environmental engineers.

These SLOs are grouped into the three areas of:

1. Content Knowledge (SLO #1 and SLO #2)
2. Critical Thinking (SLO #3)
3. Communication (SLO #4)

Curriculum Map

Curriculum Map for:

Program: Environmental Engineering

College of Engineering

Key: Introduced

Reinforced

Assessed

Courses SLOs	CHM 2046	CHM 2046L	ENC 3254	MAP 3202	EES 4203	EMV 3040C	EES 4201	EES 4103	EES 4102L	ENV 4041C	EMV 4514C	EMV 4121	ENV 4351	ENV4432 or ENV4532 or ENV4122 or ENV4353 or ENV4913	FE Exam	Exit Survey
Content Knowledge																
#1	I			I	R	A Exam Question	A Exam Question								A	A
#2		I			R		R	R	A Lab Report	A Lab Report						A
Critical Thinking																
#3											I	R	R	A Design Report	A	A
Communication																
#4			I						R	R	A Design Report			A Design Report		A

Assessment Cycle

The SLOs in Environmental Engineering represent a subset of 18 SLOs used in connection with Engineering Accreditation as required through the Accreditation Board for Engineering and Technology (ABET). The ABET accreditation cycle is 6 years, but the assessments are carried out every year, so the same assessment frequency is used for the assessment methods outlined in Figure 2. The review analysis and interpretation of assessment data is performed by committee in late fall or early spring, with improvement actions by late spring and implementation slated for the fall semester in time for each new Undergraduate Catalog cycle.

Assessment Cycle Chart

Assessment Cycle for:

Program: Environmental Engineering

College of Engineering

Analysis and Interpretation:

November-January

Improvement Actions:

Completed by May 1

Dissemination:

Completed by August 15

SLOs	Year	10-11	11-12	12-13	13-14	14-15	15-16
Content Knowledge							
#1		x	x	x	x	x	x
#2		x	x	x	x	x	x
Critical Thinking							
#3		x	x	x	x	x	x
Communication							
#4		x	x	x	x	x	x

Methods and Procedures

SLO Assessment Matrix

Assessment Method - For each SLO, please enter the assessment method you are using – exam (course, internal, or external), project, paper, presentation, performance, etc.

Measurement – list the measurement procedure you use for this outcome. It can be a faculty-developed rubric with the minimum acceptable level identified, an exam score and the minimum passing score, or other measurement. **Required for 2012-13: Include at least one example of a rubric used to assess an SLO.**

SLO Assessment Matrix for 2012-13

2012-13 Student Learning Outcome	Assessment Method	Measurement Procedure
Apply knowledge of mathematics, science and engineering principles to environmental engineering problems.	Exam questions; FE Exam; Exit survey	faculty-developed rubric used by the assessment committee
Design and conduct environmental engineering experiments, as well as analyze and interpret the data.	Lab reports; Exit survey	faculty-developed rubric used by the assessment committee
Design an environmental engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability constraints.	Design reports; FE Exam; Exit survey	faculty-developed rubric used by the assessment committee
Communicate technical data and design information effectively in writing and in speech to other environmental engineers.	Design reports; Exit survey	faculty-developed rubric used by the assessment committee

Rubric for: SLO #4

Communicate technical data and design information effectively in
writing and in speech to other environmental engineers.

	1	3	5
Effective communication in writing	lack of focus poorly organized numerous grammatical errors numerous spelling errors	focused reasonable organization few grammatical errors few spelling errors	Maintains excellent focus; well-organized; consistently observes grammar & spelling rules
Effective communication in speech	difficult to understand; poor eye contact; many grammatical errors; no enthusiasm poor visual aids	understandable intermittent eye contact few grammatical errors shows some enthusiasm	very clear presentation; excellent eye contact; enthusiastic & convincing Conventional grammar; excellent visual aids

The four SLOs are assessed through the following direct and indirect methods:

Direct Methods:

1. Coursework-based assessment in Environmental Engineering courses
2. Fundamentals of Engineering (FE) Examination

The Fundamentals of Engineering Examination provides an objective third-party assessment which is nationally-normed. The NCEES examination reports provide such overall passing rates results plus individual exam topic subscores. The FE exam cannot be used to assess all four of the SLOs; the rubric for assignment of FE exam results to the various SLOs is shown below:

SLO #1: Overall result plus morning (4-hour) exams in the following topic areas: Mathematics, Probability & Statistics, Chemistry, Electricity & Magnetism, Engineering Mechanics, Fluid Mechanics, Thermodynamics.

SLO #2: N/A

SLO #3: Afternoon (4-hour) exam in the following topic areas: Air Quality Engineering, Solid and Hazardous Waste, Water and Wastewater Engineering, and Water Resources

SLO #4: N/A

Indirect Methods:

Senior Exit Survey: Student self-assessment of achievement of SLOs performed each semester by graduating seniors.

The Senior Exit Survey, completed by students in their final semester, is a graduation requirement recorded in ISIS audits, so we are able to achieve survey rates of 100%. The students are asked to self-assess their performance in achieving the outcomes on a 1-5 scale as they complete their UF careers.

Assessment Method	Administered By	When Administered
Direct Assessments		
Student Performance in Courses	Environmental Engineering Faculty Committee	Every semester
Student Performance on FE Exam	NCEES	1. Semi-Annually (April, October)
Indirect Assessments		
Senior Exit Survey	Department and Advisors(Self-Assessment)	Every semester to graduating seniors

Assessment Oversight

Oversight of the assessment process is the primary responsibility of the Department Head with the cooperation of the Environmental Engineering Sciences ABET Committee. The Environmental Engineering Sciences Department resides within the Engineering School of Sustainable Infrastructure and Environment (ESSIE) which is led by a Director who is also in charge of the Department of Civil and Coastal Engineering. The contact information for the Department Head of Environmental Engineering Sciences and the Director of ESSIE are provided below:

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