

# Institutional Effectiveness Report 2020-2021

**Program:** Civil & Environmental Engineering BS

**College and Department:** College of Engineering – Civil Engineering

**Contact:** Ben Mohr

**Mission:** The mission of the civil engineering program is to offer the strong academic content necessary to produce well-educated graduates who become innovative and productive members of society. Graduates will possess both the problem-solving skills and the fundamentals of critical thinking and analysis that are crucial for success within the framework of the civil and environmental engineering profession.

## Program Goals

- PG 1. Graduates should demonstrate the ability for early career professional growth based on their grasp of fundamental concepts in civil engineering.
- PG 2. Graduates should utilize knowledge and skills to participate in civil engineering design and/or management processes.
- PG 3. Graduates should develop professionally through a commitment to life-long learning.

## Student Learning Outcomes

Students should demonstrate...

- SLO 1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- SLO 2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- SLO 3. an ability to communicate effectively with a range of audiences
- SLO 4.

SLO 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

A departmentally developed curriculum map can be found in Appendix 1 that shows the connections between courses and student learning outcomes.

Attainment of PG 1 is supported by Student Outcomes: 1,2,4,6

Attainment of PG 2 is supported by Student Outcomes: 3,4,5

Attainment of PG 3 is supported by Student Outcome: 7

### Assessment Methods

1. **Course Components** are grades on a specific, recurring assignment or collection of assignments in a specific course. The assignment must be common to all faculty who teach the course.
2. **FE Exam** provides a measure of Civil Engineering content knowledge. The FE Exam topic area ratio scores provided to CEE by the National Council of Examiners for Engineering and Surveying. CEE requires all students to take the FE exam, so our scores are representative of all students.
3. **Final Course Grades** are accumulated across a graduating class. That is, the average grade in a specific course for all the students who graduated in a given term.
4. **Course Instructional Outcome Surveys and Senior Exit Surveys** are Likert scale survey questions. All have 4 answers: Strongly Disagree, Disagree, Agree, and Strongly Agree. CEE is experimenting with annual alumni surveys due to low response rates.

Expected Levels of Attainment: Because of scale differences between metrics, CEE has implemented color-coding to aid in the review process. The color coding and the criteria used in its application are found below:

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The faculty chose to include multiple metrics for each SLO. Multiple metrics help the faculty to avoid unneeded reactions to statistical outliers that occur during any evaluation. As such, the occurrence of a single Unacceptable rating will not necessarily require a response.



Due to a change in the curriculum effective Fall 2021, it is anticipated that an additional required course, CEE 3500



SLO 4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

In order to capture different parts of SLO 4, the outcome was split into two parts, with their respective direct assessment metric.

1. "an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments..."
2. "...which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts."

For both parts of SLO 4, CEE 4920 Professionalism and Ethics was used. Previously, the main focus was on the final course grade. However, for the S7701 Tc 2u (v)-5.5 (io)-6.6 (u)2.3 (s)-1.3 (l)10.6 (y)-4.6 (,)-1 ( t)-2.9 (h)13.1 (e)-33

SLO 5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

SLO 5 was broken into three parts for assessment. Many of the assessments were similar to the previous student outcomes.

1. "an ability to function effectively on a team whose members together provide leadership..." – CEE 4950 Senior Design focused on leadership such that a previous assessment was given on leadership and has been carried over to the new student outcome.
2. "...create a collaborative and inclusive environment..." – Peer evaluations are a part of our CEE 4950 grading scheme. In other words, students are directly assessing each other regarding their group. While part of this assessment could fall under the "function effectively on a team..." part of the student outcome, it was strongly felt that a collaborative and inclusive environment is fundamental to the function of a team. As such, the prior peer evaluation has been continued, albeit with slightly different assessment wording.
3. "...establish goals, plan tasks, and meet objectives..." – Students were previously assessed on management pr





SLO 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

During the Fall 2020 semester, the final technical (mentor) grade in the capstone courses was dropped from use as a measure of attainment for SLO 7. Instead, components of a student project were chosen to demonstrate attainment of the student outcome. The }μœ • U đ ô ì ì ' } š Z v] o v P]v œ senior-level required course in the curriculum.



