

## Institutional Effectiveness Report 2018-19

**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-

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

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

Attainment of PEO 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 Likn Surv1-1.3 ( .21)7.8Ei2 Td(a)10.6dr3 2T.3 ()-7.6



In March/April, the CEE Chair reviews Fall (July-December) FE Exam results. The Advisory Board also reviews both Program Educational Objectives and departmental Mission/Vision statements to give input for the upcoming Fall Faculty Retreat.

In June/July, Spring FE Results are typically received and staff tabulate all Student Outcome metrics from the prior academic year. These metrics are then reviewed by the Chair in preparation for the Fall Faculty Retreat, at which point the cycle begins again.

This schedule provides for annual opportunities to identify and react to both course-level and program-level issues as they become apparent. Thus, in addition to helping reduce dependence on a large-scale mid-cycle and end-of-cycle review, the new schedule allows for fa02dend prdenepricse 10.6 (y)-4.5 ( re)7..9 (ric.3 ( f)105

Based on the thresholds for a required response, there are apparent issues with CEE 4310 Steel Design and 4320 Concrete Design final course grades as bo1

*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*

All metrics for this outcome are shown in the table below:

Based on the thresholds for a required response, we see as we did in SO 1 the issues with CEE 4310 Steel Design and 4320 Concrete Design final course grades as both metrics has multiple reds for the given academic year. As referenced in SO 1, two structural faculty who taught those courses departed CEE in 2016-17, with a one-year gap before new adjunct/faculty arrived. Recent faculty hires and time for those new hires to acclimate should reverse the trend. We will monitor progress for the next year to see if further actions are required.

*SO 3. An ability to communicate effectively with a range of audiences*

Communication skills are assessed separately for both oral and written in CEE 4950. Written communication skills are directly measured for both the technical report and poster presentation. The oral presentation component has been separated out as "Presentation Skills". The "Quality of Slides" component functions as a measure of both written and oral communication skills.

All metrics for this outcome are shown in the table below:

There are no metrics in red and only one metric in yellow for the current year with no past trend of yellow. Hence no response is currently required. Students continue to perform at a high level indicating excellent performance.

*SO 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 social contexts*

There are no metrics in ~~CEE 4950~~ -2019. Hence no response is currently required. Students continue to perform at a high level of performance on all metrics including the new survey questions.

*SO 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*

SO 5 is broken into three parts for assessment.

1. "an ability to function effectively on a team whose members together provide leadership..." – CEE 4950 Senior Design focuses on leadership.
2. "...create a collaborative and inclusive environment..." – Peer evaluations are a part of our CEE 4950 Senior Design grading scheme. Students directly assess each other regarding their group.
3. "...establish goals, plan tasks, and meet objectives..." – Students are assessed on management principles in CEE 4950 Senior Design, which will continue under the new student outcomes.

While two metrics appear in yellow, these metrics have not remained in yellow for multiple academic years.



*SO 6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*

While the Geotechnical Engr lab report fell into the unacceptable threshold for a semester, there is no trend of consecutive years of red. As a single occurrence, no actions are currently warranted. Students continue to perform well on all other metrics.

*SO 7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies*

The Overall FE Exam pass rate continues to improve since moving CEE 4940 FE Review from the last semester to the penultimate semester and reformatting the course from an independent study to an in-person review class. The in-person review class seems to have had a large impact on the pass rate.

All other metrics including the new Senior Exit Survey questions indicate an excellent level of process for students.

## **Modifications for Improvement:**

### *SO 1 and SO 2*

CEE 4310 Steel Design and 4320 Concrete Design final course grades had multiple reds for the current academic year. As noted previously, two structural faculty who taught those courses departed CEE in 2016-17, with a one-year gap before new adjunct/faculty arrived. Recent faculty hires and time for those new hires to acclimate should reverse the trend. We will monitor progress for the next year to see if further actions are required.

### *SO 5*

While two metrics appear in yellow, these metrics have not remained in yellow for multiple academic years. However, faculty are considering additional elements to support student progress on the Management Paper.

## **Appendices**

- 1.