

Assessment Overview & Results Summary

College/School: Shiley-Marcos School of Engineering

Measures Used: The process to assess achievement of each student outcome is based upon evaluation of student work, complemented by senior exit surveys, faculty observations, and input from stakeholders represented on the department's advisory board. Assessments of student work and senior exit surveys are done annually. Faculty observations and stakeholder input are solicited every two or three years. The process to assess and evaluate student work was updated during the 2020/21 academic year to consider individual student work directly related to a specific student outcome (SO).

Process for Interpretation of Evidence: Student performance data from courses are assessed directly to demonstrate achievements of the student outcomes (SOs) via the use of Student Performance Assessment Data Forms (SPADFs). They link the work of an individual student to a specific SO of the program. Each instructor is responsible for including student assignments that can be used to assess the SOs that must be met by that particular course. The assessment is generally performed by sampling course sections taught by full-time faculty. This provides an evaluation of a substantial number of students in each cohort, as the vast majority of upper-division required mechanical engineering courses are taught by full-time faculty. Faculty assess the work of an individual student using standardized rubrics developed for each individual SO. The assessment is hence specific to individual SOs and to individual students.

While a single piece of individual student work may be used to assess multiple SOs, quantitative assessment is disaggregated by using unique rubrics for each SO. For each SO, a set of distinct performance indicators have been defined that are standardized to four levels (1 = beginning; 2 = developing; 3 = proficient; 4 = exemplary). Faculty assess student work using performance indicators appropriate to the course. For each student, an overall score is determined by averaging the values of the performance indicators. A student meets the SO if their performance is at least 2.5. To evaluate program-wide success at meeting each SO, the number of students meeting the proficient level (average score 2.5 or greater) of the SO and the total number of students are summed over all course sections used to assess that SO. The ratio of the total number of students meeting the target SO to the

total number of students enrolled in the respective courses is computed. The program meets the SO if the ratio is at least 70%.

How Findings are Used:

- ✓ Changes to curriculum/pedagogy
- ✓ Changes to assessment methods

**Results Summary and
Continuous Improvement
Actions for AY 2020-2021:**

The assessment goal of at least 70% of students achieving the proficient level (average score 2.5 or greater) was met for all SOs with a single exception. The assessment data indicated that only 64% of the students assessed met or exceeded a proficient level for SO4, which states that students have “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”. The data further indicated that the lower proficiency was mainly observed in required junior-level courses, but not in required senior-level courses. For the 2021/22 academic year, the program faculty will add additional content to junior courses in order to address ethical and professional responsibilities at an earlier time in the program.