

Mechanical Engineering (BS) – ENG

Director/Chair: Dr. John Abraham

Assessment Lead: Dr. John Abraham

Step 1: Student Learning Outcome

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

Step 2: Assessment Methods and Measures

Method 1: In ME 490W the course instructor will evaluate the individual performance to Learning Objective 6 using student inputs provided in a supplemental written assignment answering these questions:

- 1.** Describe your individual contribution to testing and experimentation during the project (this can be via mathematical modeling and simulation (i.e. FEA) or physical experiments)
- 2.** Describe how you employed the data (via modeling and simulation or experimentation) obtained to make improvements to the design.

Rubric: This assignment will be evaluated based on the writing responses. Each of the two main answers will be graded on the content as well as the quality of the writing. Evaluation criteria will focus on the following:

- 1.** Strong understanding of the assessment questions
- 2.** Thorough responses with examples to illustrate ideas
- 3.** Clear application of skills for future use

Method 2: Individual Evaluation Method: End of Course Final Report Evaluation in ME 491.

Type: Rating scale (1-10).

The course instructor will evaluate the individual performance to Learning

Objective 6 using student inputs provided in a final report supplemental assignment answering these questions:

Explain briefly with specific reference to the requirements document, weekly update forms, or final report (include page numbers and sections):

1. How you designed and conducted experiments to verify the functionality of your design.
2. How you interpreted the experimental results to inform changes and improvements in your design.
3. How you used engineering judgement to draw conclusions regarding your assembly and testing processes.

Rubric: Student Score = (Response a + Response b + Response c)/30

Method 3: In ME 330 an assessment was based on the individual evaluation of each student's experimental analysis as determined by scoring their individual authorship of portions of the group lab report 5. Each student section included a balance of experimental work description, data analysis, and interpretation / conclusions. This lab report is the last formal lab report for the course and shows the culmination of progress for the semester.

Step 3: Criteria for Success

Criterion 1: 70% of students will score in the Adequate or Exemplary levels on the rubric.

Criterion 2: 70% of students will score in the Adequate or Exemplary levels on the rubric.

Criterion 3: 80% of students score above 70% (either obtaining Adequate or Exemplary).

Step 4: Summary of Results

Results Summary 1: 128 students were assessed and 125 scored Adequate or Exemplary on the rubric, this is 96.9% of the students assessed.

Results Summary 2: Of the 57 students assessed on the rubric, 50 scored either Adequate or Exemplary.

Results Summary 3: This reporting period shows that 97.8% of students are above the 70% level as compared to 96.8% from Fall 2022.

Change from prior reporting period:

The methodology has changed from the last reporting period which was based on group performance for experimentation and analysis as determined by the group score for lab report 5 and not individual student performance. This improved granularity distinguishes individual performance which otherwise is clouded by the overall group performance.

Step 5: Action Plan

Every semester assessment data is compiled to be presented at a departmental Course Roundup meeting for discussion of changes and/or improvements.