

UNIT REPORT

**Mechanical Engineering BS - Final
Annual Report**

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Department Mission, Vision, and Educational Objectives**Start:** 07/01/2017**End:** 06/30/2018**Providing Department:** Mechanical Engineering BS**Department/Unit Contact:** Mohan Rao**Mission/Vision/Goal Statement:**

The BSME program at TTU is a traditional on-campus lecture/laboratory program with on-ground course delivery offered almost exclusively during the day. There currently are no distance learning courses offered by the Mechanical Engineering Department. A co-op program is available through the TTU Center for Career Development as an optional (but popular) choice.

MISSION: The Mechanical Engineering (ME) Department, within a regional and global context, will prepare its students for productive career in a competitive, dynamic, technologically-based society; will advance the knowledge of mechanical engineering principles and applications; and will serve the public.

VISION: The Mechanical Engineering Department at Tennessee Tech aspires to be recognized globally for outstanding education and research, leading to well-qualified engineers who are adaptive professionals, inquisitive, entrepreneurial and successful in engineering practice, research, and public service.

PROGRAM EDUCATIONAL OBJECTIVES:

Objective 1: Within one to two years following graduation, our students should be:

- Productively employed or in good academic standing in a program of postgraduate studies;
- Participating, at some level, both in organizations that serve their profession and that serve the public;
- Confident and optimistic about their future; and
- Involved in activities that demonstrate a commitment to, and appetite for, ongoing personal and professional growth and learning.

Objective 2: Approximately five years after graduation, we wish to see evidence of:

- Career advancement;
- Assumption of positions and roles of greater responsibility to their employer/employees and the public;
- Recognized as being professionally competent in their field, and
- Involved in activities that demonstrate a commitment to, and appetite for, ongoing personal and professional growth and learning.

LINKAGE OF EDUCATIONAL OBJECTIVES TO THE INSTITUTIONAL MISSION:

- The BSME Program Educational Objectives indicates that graduates should be "productively employed, professionally competent and showing career advancement, with service both to the public and the profession." This is consistent with the mission of the ME Department, which is to "... prepare its students for productive careers in a competitive, dynamic, technologically-based society (in a global and regional context); will advance the knowledge of mechanical engineering principles and applications; and will serve the public."
- The preceding mission statement of the ME Department is, in turn, tied directly to the College of Engineering's Mission Statement to "graduate innovative engineers who solve technological challenges to meet societal needs."

- Finally, the College of Engineering mission is strongly linked to the overall mission of the University. The opening sentence of the TTU Mission Statement reads: "Tennessee Technological University's mission as the state's only technological university is to provide leadership and outstanding programs in engineering, the sciences, and related areas that benefit the people of Tennessee and the nation."

Goal 1: Course and Career Advising

Define Goal:

Improved advising has become a top priority for both the College and University, as evidenced by their presence in in the strategic plans of both, and the increased resources and effort being expended in this area. Included among these are:

- (1) Formation of a College of Engineering "Student Success Center", with a director, a staff person, two advisors (one part time for international students), and student ambassadors
- (2) Four additional permanent advisors being hired for the CoE by the University

Student Outcome A: Knowledge of STEM Courses

Define Goal:

Student Outcome A: an ability to apply knowledge of mathematics, science, and engineering

Intended Outcomes / Objectives:

Student Outcome B: Design Experiments and Interpret Data

Define Goal:

Student Outcome B: an ability to design and conduct experiments, as well as to analyze and interpret data

Student Outcome C: Design a System with Realistic Constraints

Define Goal:

Student Outcome C: an ability to design a system, component, or process to meet desired needs within realistic ;constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;

Student Outcome D: Function on Multidisciplinary Teams

Define Goal:

Student Outcome D: an ability to function on multidisciplinary teams

Student Outcome E: Identify and Solve Engineering Problems

Define Goal:

Student Outcome E: an ability to identify, formulate, and solve engineering problems

Student Outcome F: Professional and Ethical Responsibility

Define Goal:

Student Outcome F: an understanding of professional and ethical responsibility

Student Outcome G: Ability to Communicate Effectively

Define Goal:

Student Outcome G: an ability to communicate effectively

Student Outcome H: Broad Education for Global Context

Define Goal:

Student Outcome H: the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

Student Outcome I: Life-long Learning

Define Goal:

Student Outcome I: a recognition of the need for, and an ability to engage in life-long learning

Student Outcome J: Contemporary Issues**Define Goal:**

Student Outcome J: a knowledge of contemporary issues

Student Outcome K: Modern Engineering Tools**Define Goal:**

Student Outcome K: an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Student Outcome L: Ability to Transition Concepts and Theory to Real Engineering Applications**Define Goal:**

Student Outcome L: an ability to transition from engineering concepts and theory to real engineering applications

Assessment Tool: Alumni Survey

Goal/ Outcome/ Objective: Student Outcomes D,E,F,G,H,I,J,L

Type of Tool: Survey

Frequency of Assessment: Annually

Rationale:

Alumni surveys are sent out to graduates of the BSME program at intervals of one and five years post-graduation. The questions on this survey are used to assess Student Outcomes and provide information related to the Program Educational Objectives. The Alumni Survey employs a 5-pt "agree/disagree" scale (1 to 5), which is converted to a 0-4 pt. level-of-attainment scale by simply subtracting 1 pt.

Assessment Tool: Co-Op Employer Survey

Goal/ Outcome/ Objective: Student Outcomes D, E, F, G, H, I, J

Type of Tool: Survey

Frequency of Assessment: Each Semester

Rationale:

Roughly half of ME students participate in co-ops / internships during their time at TTU. For co-ops that are sponsored through the TTU Office of Career Services, the co-op employers are required to complete a formal evaluation of the performance of each student at the end of the co-op. In addition, for College of Engineering students, the co-op survey also includes program- and Student Outcome-related assessment questions. Co-op surveys are a valuable source of feedback directly from employers of our students, providing insight into their performance in-process, i.e., before they graduate. The Co-Op Employer Survey employs a 5-pt scale (1 to 5), which is then converted to a 0-4 pt. level-of-attainment scale by subtracting 1 pt.

Assessment Tool: Grades Received in STEM, General Education, and Communication Courses

Goal/ Outcome/ Objective: Student Outcomes A, G, H, J

Type of Tool: Tracking Spreadsheet

Frequency of Assessment: Every 3 Years

Rationale:

The grades earned by BSME graduates in STEM, Gen Ed, Writing, and Speech courses can be used as a direct, independent source of evidence for several of the Student Outcomes, in particular h, j, and g:

a: an ability to apply knowledge of mathematics, science, and engineering

h: the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

j: a knowledge of contemporary issues

g: an ability to communicate effectively

Course grades are directly converted to the 0-4 pt. level-of-attainment scale as follows:

"A" → level of attainment = 4 (Excellent) "B" → level of attainment = 3 (Good)
 "C" → level of attainment = 2 (Satisfactory) "D" → level of attainment = 1 (low)
 "F" → level of attainment = 0 (negligible)

Assessment Tool: ME External Advisory Board Feedback

Goal/ Outcome/ Objective: ME External Advisory Board Feedback

Type of Tool: Advisory Board

Frequency of Assessment: Bi-Annually

Rationale:

Feedback from the ME External Advisory Board is an important source of program improvement, guidance, and supporting evidence regarding the performance of students who are graduates of the BSME program. The Advisory Board contains representatives of several key constituency groups of the program, i.e., employers, alumni, and the professional community at large.

Assessment Tool: Senior Exit Interview Written Survey

Goal/ Outcome/ Objective: Student Outcomes D, E, F, G, I, J, K, L

Type of Tool: Survey

Frequency of Assessment: Each Semester

Rationale:

The Senior Exit Written Survey is one part of the Senior Exit Interview process. It allows students graduating from the BSME program to provide feedback regarding Student Outcomes, the BSME program, the ME Department, and the student's activities while at TTU. The Senior Exit Written Survey uses a 1-7 pt. "satisfaction" scale which is then converted to a 0-4 pt. level-of-attainment scale.

Assessment Tool: External Evaluation of Senior Design Projects

Goal/ Outcome/ Objective: Student Outcomes C, D, G, I, J, K, L

Type of Tool: Capstone Project

Frequency of Assessment: Fall and Spring Semester

Rationale:

External evaluators are used to assess the Senior Design Projects and Project Presentations. In spring, 2014, a new version of the External Evaluator Form was developed, replacing the forms previously used in the course for project and presentation evaluation. The External Evaluation of Senior Design Projects tool uses the previously discussed 0-4 pt. level-of-attainment scale.

Assessment Tool: Instructional Outcomes - Faculty Assessment

Goal/ Outcome/ Objective: Student Outcomes A, B, C, D, E, F, G, H, I, J, K, L

Type of Tool: Survey

Frequency of Assessment: Annually

Rationale:

This new measurement tool provides an assessment of the level-of-attainment of the students in a class with regards to the course's Instructional Outcomes. The assessment is done by the course instructor at the completion of the course. It consists of a detailed analysis of the extent to which the Instructional Outcomes are achieved, as evidenced by student performance on specific test and homework problems, and other course assignments.

The Instructional Outcomes–Faculty Assessment tool uses a 0-4 pt. level-of-attainment scale.

Assessment Tool: Instructional Outcomes - Student Survey

Goal/ Outcome/ Objective: Student Outcomes B, C, D, E, F, G, H, I, J, K, L

Type of Tool: Survey

Frequency of Assessment: Fall and Spring Semester**Rationale:**

The Instructional Outcomes survey is administered to students in selected key courses in the BSME curriculum (ME2001 Elem. M.E. Analysis, ME 3023 Measurements in Mechanical Systems, ME 3910/3900 M.E. Seminar/Professionalism & Design, ME 4020 Applied Machine Design, ME 4444 Senior Design Project, ME 4720 Thermal Design, ME 4751 Energy Systems Lab). The survey provides a self-assessment of student progress in achieving the Instructional Outcomes of the course. This is based on the difference between a student's level of knowledge upon entering a course and upon leaving the course. The survey is an indirect, but useful, supporting source of data to other measurement tools. Course Instructional Outcomes are mapped to Student Outcomes. The Instructional Outcomes–Student Survey tool uses the 0-4 pt. level-of-attainment scale.

Assessment Tool: NCEES Fundamentals of Engineering (FE) Exam

Goal/ Outcome/ Objective: Student Outcomes A, B, E, F, H

Type of Tool: Certification Exam

Frequency of Assessment: Offered Fall and Spring Semester

Rationale:

The subject-area results of the NCEES Fundamentals of Engineering Exam are used in the assessment and improvement process of the BSME program. Of particular interest is the ratio of TTU student performance to the National Average performance in each subject area. A ratio of greater than 1.0 indicates that TTU students are outperforming the national average on the exam in that subject area. A ratio of less than one indicates underperformance. In the BSME program, taking the exam is voluntary; however, approximately 30-50% typically will do so in a given semester. To help student prepare for the exam, a number of attempts have been made to offer organized FE review sessions in a variety of formats. Unfortunately, these have largely been unsuccessful due to poor attendance by the students. As a result, student performance is not as high as it could be on the exam. With this limitation in mind, the correspondence between the FE exam data and level-of-attainment has been set as follows:

- (a) \geq national average \rightarrow level of attainment = 4 (Excellent)
- (b) \geq 90% national average \rightarrow level of attainment = 3 (Good)
- (c) \geq 80% national average \rightarrow level of attainment = 2 (Satisfactory)
- (d) \geq 70% national average \rightarrow level of attainment = 1 (low)
- (e) $<$ 70% national average \rightarrow level of attainment = 0 (negligible)

Assessment Tool: Senior Exit Oral Interview

Goal/ Outcome/ Objective: Student Outcomes

Type of Tool: Focus Group

Frequency of Assessment: Each Semester

Rationale:

The Senior Exit Oral Interview process consists of an open discussion forum of graduating seniors with the ME Chair and Associate Chair. It serves as a valuable source of suggestions for program improvement, as well as a source of supporting feedback on student performance. After receiving the feedback from the students, issues of particular or continuing concern are brought to the ME Faculty for further discussion and possible action.

Results: Level-of-Attainment: Student Outcome A

Goal/Objective/Outcome Number: Student Outcome A

Results:

- Instructional Outcomes-Student Survey
A number of Instructional Outcomes of these courses were used as an indicator of student level-of-attainment (2.8) of Outcome 3a. See Summary & Raw Data for Instructional Outcomes- Student Survey.
- Student Grades in STEM Courses
The average grade for all students graduating from the BSME program since 2014 Spring in STEM courses (Math, Chemistry, Physics, Engineering) was a "3.1". See GPA in Selected Course Areas for details.
- Instructional Outcomes-Faculty Assessment– for a number of courses
This outcome was rated as a "3.4". See Instructional Outcomes-Faculty Assessment.
- Taken together, the above assessment tools are judged to indicate an overall level-of-attainment for Student Outcome 3a of approximately "3.1".

- Senior Exit Interview Written Survey

The student responses on two questions from the Senior Exit Written Survey indicated a level-of-attainment of "4.0" for Outcome 3d. See Senior Exit Written Survey- Data Summary

- Instructional Outcomes-Faculty Assessment

The faculty assessment of the Instructional Outcomes related to Outcome 3d in a number of courses was "3.6". See Instructional Outcomes-Faculty Assessment.

- Instructional Outcomes-Student Survey

An average level-of-attainment of "3.0" was obtained on the Student Survey of these courses. See Summary & Raw Data for Instructional Outcomes-Student Survey.

- Co-Op Employer Survey

An average level-of-attainment of "3.5" was obtained on this survey instrument of the employers of co-op students from the BSME program. See Co-Op Employer Survey-Summary and Raw Data.

- Alumni Survey

An average level-of-attainment of "2.9" was obtained on this survey instrument of alumni BSME program. See Alumni Survey-Summary Data.

Taken together, the above assessment tools indicate an overall level-of-attainment for Student Outcome 3d of "3.4".

Attachments: Attached Files

- [☐ Alumni Survey - Summary Data](#)
- [☐ Co-Op Employer Survey-Summary and Raw Data](#)
- [☐ Instructional Outcomes - Faculty Assessment](#)
- [☐ Senior Exit Written Survey - Data Summary](#)
- [☐ Summary - External Evaluations of Senior Design Projects 2017-2018](#)
- [☐ Summary & Raw Data for Instructional Outcomes - Student Survey](#)

Results: Level-of-Attainment: Student Outcome E

Goal/Objective/Outcome Number: Student Outcome E

Results:

- Senior Exit Interview Written Survey

The student responses on two questions from the Senior Exit Written Survey indicated a level-of-attainment of "4.0" for Outcome 3e. See Senior Exit Written Survey- Data Summary.

- Instructional Outcomes-Faculty Assessment

The faculty assessment of the Instructional Outcomes related to Outcome 3e in a number of courses was "3.3". See Instructional Outcomes-Faculty Assessment.

- Instructional Outcomes-Student Survey

An average level-of-attainment of "2.7" was obtained on the Student Survey of these courses. See Summary & Raw Data for Instructional Outcomes-Student Survey.

- Co-Op Employer Survey

An average level-of-attainment of "3.2" was obtained on this survey instrument of the employers of co-op students from the BSME program. See Co-Op Employer Survey-Summary and Raw Data.

- Alumni Survey

An average level-of-attainment of "3.0" was obtained on this survey instrument of alumni BSME program. See Alumni Survey-Summary Data.

Taken together, the above assessment tools indicate an overall level-of-attainment for Student Outcome 3e of "3.2".

Attachments: Attached Files

- [☐ Alumni Survey - Summary Data](#)
- [☐ Co-Op Employer Survey - Summary and Raw Data](#)
- [☐ Instructional Outcomes - Faculty Assessment](#)
- [☐ Senior Exit Written Survey - Data Summary](#)
- [☐ Summary & Raw Data for Instructional Outcomes - Student Survey](#)

Results: Level-of-Attainment: Student Outcome F**Goal/Objective/Outcome Number:** Student Outcome F**Results:**

• Senior Exit Interview Written Survey

The student responses on two questions from the Senior Exit Written Survey indicated a level-of-attainment of "2.3" for Outcome 3f. See Senior Exit Written Survey- Data Summary.

• Instructional Outcomes-Faculty Assessment

The faculty assessment of the Instructional outcomes related to Outcome 3f in a number of courses was a "3.2". See Instructional Outcomes-Faculty Assessment.

• Instructional Outcomes-Student Survey

An average level-of-attainment of "2.8" was obtained on the Student Survey of these courses. See Summary & Raw Data for Instructional Outcomes-Student Survey.

• Co-Op Employer Survey

An average level-of-attainment of "3.3" was obtained on this survey instrument of the employers of co-op students from the BSME program. See Co-Op Employer Survey-Summary and Raw Data.

• Alumni Survey

An average level-of-attainment of "3.0" was obtained on this survey instrument of alumni BSME program. See Alumni Survey-Summary Data.

Taken together, the above assessment tools indicate an overall level-of-attainment for Student Outcome 3f of "2.9".

Attachments: Attached Files

- [☐ Alumni Survey - Summary Data](#)
- [☐ Co-Op Employer Survey-Summary and Raw Data](#)
- [☐ Instructional Outcomes - Faculty Assessment](#)
- [☐ Senior Exit Written Survey - Data Summary](#)
- [☐ Summary & Raw Data for Instructional Outcomes - Student Survey](#)

Results: Level-of-Attainment: Student Outcome G**Goal/Objective/Outcome Number:** Student Outcome G**Results:**

• External Review of Senior Design Projects

The evaluation of the senior design projects in 2017-2018 indicated a level-of-attainment of "3.3" for this outcome. See Summary - Evaluations of Senior Design Projects 2017-2018 for more details.

• Senior Exit Interview Written Survey

The student response to one question from the Senior Exit Written Survey indicated a level-of-attainment of "3.6" for Outcome 3g from this tool. See Senior Exit Written Survey- Data Summary.

• Instructional Outcomes-Faculty Assessment

The faculty assessment of the Instructional Outcomes related to Outcome 3g for a number of courses were "3.4". See Instructional Outcomes-Faculty Assessment.

- Instructional Outcomes-Student Survey

An average level-of-attainment of "3.0" was obtained on the Student Survey linked to Student Outcome 3g in these courses. See Summary & Raw Data for Instructional Outcomes-Student Survey.

- Co-Op Employer Survey

An average level-of-attainment of "3.0" was indicated on the two questions relating to written and oral communication skills. See Co-Op Employer Survey-Summary and Raw Data.

- Alumni Survey

An average level-of-attainment of "2.9" was indicated on the two questions relating to written and oral communication skills. See Alumni Survey-Summary Data.

- Student Grades in Writing and Speech Courses

The average grade for all students graduating from the BSME program since 2014 Spring in ENGL 1010/102 Writing I/II was a "3.4" and in their speech course, (SPCH 2410 Speech or PC 2500 Professional Communications) was a "3.7". See GPA in Selected Course Areas.

Taken together, the above assessment tools indicate an overall level-of-attainment for Student Outcome 3g of "3.3".

Attachments: Attached Files

- [☐ Alumni Survey - Summary Data](#)
- [☐ Co-Op Employer Survey - Summary and Raw Data](#)
- [☐ GPA in Selected Course Areas](#)
- [☐ Instructional Outcomes - Faculty Assessment](#)
- [☐ Senior Exit Written Survey - Data Summary](#)
- [☐ Summary - Evaluations of Senior Design Projects](#)
- [☐ Summary & Raw Data for Instructional Outcomes - Student Survey](#)

Results: Level-of-Attainment: Student Outcome H

Goal/Objective/Outcome Number: Student Outcome H

Results:

- Instructional Outcomes-Faculty Assessment

The faculty assessment of the Instructional Outcomes related to Outcome 3h for a number of courses was "3.3". See Instructional Outcomes-Faculty Assessment.

- Instructional Outcomes-Student Survey

An average level-of-attainment of "2.9" was obtained on the Student Survey linked to Student Outcome 3h in the courses. See Summary & Raw Data for Instructional Outcomes-Student Survey.

- Co-Op Employer Survey

An average level-of-attainment of "2.7" was indicated on the question relating to Outcome 3h. See Co-Op Employer Survey-Summary and Raw Data.

- Alumni Survey

An average level-of-attainment of "2.5" was indicated on the question relating to Outcome 3h. See Alumni Survey-Summary Data.

- Student Grades in Gen Ed Courses

The average grade for all students graduating from the BSME program since 2014 Spring in Gen Ed courses (Humanities & Fine Arts including Literature: Social & Behavioral Sciences) was a "3.0". See GPA in Selected Course Areas.

Taken together, the above assessment tools indicate an overall level-of-attainment for Student Outcome 3h of "2.9".

Attachments: Attached Files

- [☐ Alumni Survey - Summary Data](#)
- [☐ GPA in Selected Course Areas](#)
- [☐ Instructional Outcomes - Faculty Assessment](#)
- [☐ Summary & Raw Data for Instructional Outcomes - Student Survey](#)

Results: Level-of-Attainment: Student Outcome I

Goal/Objective/Outcome Number: Student Outcome I

Results:

- Senior Exit Interview Written Survey

The student response to two questions on the Senior Exit Written Survey related to Outcome 3i indicated a level-of-attainment of "2.3". See Senior Exit Written Survey- Data Summary.

- Instructional Outcomes-Faculty Assessment

The faculty assessment of the Instructional Outcomes related to Outcome 3i for a number of courses was a "3.3". See Instructional Outcomes-Faculty Assessment.

- Instructional Outcomes-Student Survey

An average level-of-attainment of "2.7" was obtained on the Student Survey linked to Student Outcome 3i in the above courses. See Summary & Raw Data for Instructional Outcomes-Student Survey.

- Co-Op Employer Survey

An average level-of-attainment of "3.2" was indicated on the question relating to Outcome 3i. See Co-Op Employer Survey-Summary and Raw Data.

- Alumni Survey

An average level-of-attainment of "3.1" was indicated on the question relating to Outcome 3i. See Alumni Survey-Summary Data.

Taken together, the above assessment tools indicate an overall level-of-attainment for Student Outcome 3i of "2.9".

Attachments: Attached Files

- [☐ Alumni Survey - Summary Data](#)
- [☐ Co-Op Employer Survey - Summary and Raw Data](#)
- [☐ Instructional Outcomes - Faculty Assessment](#)
- [☐ Senior Exit Written Survey - Data Summary](#)
- [☐ Summary & Raw Data for Instructional Outcomes - Student Survey](#)

Results: Level-of-Attainment: Student Outcome J

Goal/Objective/Outcome Number: Student Outcome J

Results:

- External Review of Senior Design Projects

The evaluation of the senior design projects in 2017-2018 indicated a level-of-attainment of "3.3" for this outcome. All projects addressed a current need of some type, and commonly involved contemporary issues such as environmental friendliness, exercise/health, energy conservation, and using technology to help disabled individuals. See Summary - Evaluations of Senior Design Projects 2017-2018 for more details.

- Senior Exit Interview Written Survey

The student response to two questions on the Senior Exit Written Survey indicated a level-of-attainment of "3.5" for Outcome 3j from this tool. See Senior Exit Written Survey- Data Summary.

- Instructional Outcomes-Faculty Assessment

The faculty assessment of the Instructional Outcomes related to Outcome 3j for a number of courses was a "3.3". See Instructional Outcomes-Faculty Assessment.

- Instructional Outcomes-Student Survey

An average level-of-attainment of "2.6" was obtained on the Student Survey linked to Student Outcome 3i in the above course. See Summary & Raw Data for Instructional Outcomes-Student Survey.

- Co-Op Employer Survey

An average level-of-attainment of "2.9" was indicated for this Outcome. See Co-Op Employer Survey-Summary and Raw Data.

- Alumni Survey

An average level-of-attainment of "2.7" was indicated for this Outcome. See Alumni Survey-Summary Data.

- Student Grades in Gen Ed Courses Related to Contemporary Issues

The average grade for all students graduating from the BSME program since 2014 Spring in the Gen Ed courses related to contemporary issues (list in the referenced appendix) was a "3.5". See GPA in Selected Course Areas.

Taken together, the above assessment tools indicate an overall level-of-attainment for Student Outcome 3j of "3.1".

Attachments: Attached Files

- [☐ Alumni Survey - Summary Data](#)
- [☐ Co-op Employer Survey - Summary and Raw Data](#)
- [☐ GPA in Selected Course Areas](#)
- [☐ Instructional Outcomes - Faculty Assessment](#)
- [☐ Senior Exit Written Survey - Data Summary](#)
- [☐ Summary - Evaluations of Senior Design Projects](#)
- [☐ Summary & Raw Data for Instructional Outcomes - Student Survey](#)

Results: Level-of-Attainment: Student Outcome K

Goal/Objective/Outcome Number: Student Outcome K

Results:

- External Review of Senior Design Projects

The evaluation of the senior design projects in Spring 2017-2018 indicated a level-of-attainment of "3.4" for this outcome. Most groups used one or more software tools in their design, typically 2D/3D CAD and FEA. See Summary - Evaluations of Senior Design Projects 2017-2018 for more details.

- Senior Exit Interview Written Survey

The student response to four questions on the Senior Exit Written Survey indicated a level-of-attainment of "3.6" for Outcome 3k from this tool. See Senior Exit Written Survey- Data Summary.

- Instructional Outcomes-Faculty Assessment

The faculty assessment of the Instructional Outcomes related to Outcome 3k in ME4444 Senior Design Project was "3.4". See Instructional Outcomes-Faculty Assessment.

- Instructional Outcomes-Student Survey

An average level-of-attainment of "2.9" was obtained on the Student Survey linked to Student Outcome 3k in these courses. See Summary & Raw Data for Instructional Outcomes-Student Survey.

Taken together, the above assessment tools indicate an overall level-of-attainment for Student Outcome 3k of "3.3".

Attachments: Attached Files

- [☐ Instructional Outcomes - Faculty Assessment](#)
- [☐ Senior Exit Written Survey - Data Summary](#)
- [☐ Summary - Evaluations of Senior Design Project](#)
- [☐ Summary & Raw Data for Instructional Outcomes - Student Survey](#)

Results: Level-of-Attainment: Student Outcome L

Goal/Objective/Outcome Number: Student Outcome L**Results:**

• External Review of Senior Design Projects

The evaluation of the senior design projects in 2017-2018 indicated a level-of-attainment of "3.5" for this outcome. This particular assessment tool is given a fairly high weight in demonstrating this outcome, as the senior projects involve finding engineering solutions to the real-world problems of external sponsors. The high ratings from the evaluators, along with verbal feedback from the sponsors, indicated that most groups had produced very successful prototypes with which the external sponsors were well-satisfied. See Summary - Evaluations of Senior Design Projects 2017-2018 for more details.

• Senior Exit Interview Written Survey

The student response to two questions on the Senior Exit Written Survey indicated a level-of-attainment of "3.7" for Outcome 3l from this tool. See Senior Exit Written Survey- Data Summary.

• Instructional Outcomes-Faculty Assessment

The faculty assessment of the Instructional Outcomes related to Outcome 3l for a number of courses was "3.6". See Instructional Outcomes-Faculty Assessment.

• Instructional Outcomes-Student Survey

An average level-of-attainment of "2.8" was obtained on the Student Survey linked to Student Outcome 3k in these courses. See Summary & Raw Data for Instructional Outcomes-Student Survey.

• Alumni Survey

An average level-of-attainment of "3.0" was indicated for this Outcome from the written comments on the Alumni Survey. See Alumni Survey-Summary Data.

Taken together, the above assessment tools indicate an overall level-of-attainment for Student Outcome 3l of "3.3".

Attachments: Attached Files

- [📄 Alumni Survey - Summary Data](#)
- [📄 Instructional Outcomes - Faculty Assessment](#)
- [📄 Senior Exit Written Survey - Data Summary](#)
- [📄 Summary - Evaluations of Senior Design Projects](#)
- [📄 Summary & Raw Data for Instructional Outcomes - Student Survey](#)