



2015-16 Academic Program Assessment Report

Reports must be uploaded into the Assessment Portal (<https://uoeee.asu.edu/assessment-portal>) and approved by the college no later than September 30, 2016.

College: ES_UG

Academic Unit:

Program: TSEGRASBSE

Program Background

Please provide your program mission statement.

List the names and titles of those participating in the assessment planning, analysis and reporting activities for this program.

Darryl Morrell, Program Chair and Associate Professor

Kristine Csavina, Clinical Assistant Professor & Associate Director of Engineering Program Innovation (left ASU in August 2016)

Please describe your program's assessment process and specific assessment activities during the 2015-16 academic year. Please include [who](#) was involved and [how](#) they were engaged in assessment activities.

Outcomes are assessed in the Senior Capstone Design course, which is a two-semester required course for senior engineering students. The capstone is the culminating design experience in a sequence of eight design courses; there is one design course in each of the nominal eight terms on the degree major map. In the capstone, the students are placed on interdisciplinary teams and work toward an engineering solution for their customers. These customers are typically industry partners in our eProject program, though some projects are faculty or student generated. Solutions usually include a physical working model or prototype or might be an engineering analysis (analytical model) of a system. Students document their work in a final technical report and in a poster presentation at the Innovation Showcase. Both activities have associated rubrics for project evaluation. Course instructors are involved in the assessment of both activities. Industry guest also assess the student teams at the Innovation Showcase and use a rubric that assessed both outcomes.

If [no data](#) were collected for this program during 2015-16, please use the space below to note the reason and describe the strategies in place to ensure that data collection will occur during 2016-17, and then continue to the last page of this report and provide any changes to your current assessment plan.

During the 2015-16 academic year, what changes have been made to the program, curriculum, and/or instruction? Why were these changes made? Please discuss how those changes were implemented and their intended impact on student learning.

The engineering and manufacturing engineering programs continued the use of the Faculty Course Assessment Reports (FCARs) for the fall and spring courses, and faculty focus groups met to evaluate students' attainment of the course outcomes and more broadly the student outcomes. This process was implemented as part of the programs' comprehensive continuous improvement efforts mandated by ABET, the engineering programs' accrediting body.

Several changes were made as a result of this process. The FCARs showed that some students were not well prepared for upper division courses and did not have the required technical background to do well. The Undergraduate committee recommended that we require a "C" or better in prerequisite courses; catalog changes were submitted in fall of 2015 and will be effective beginning in fall 2016. Additionally, changes to several individual courses were made to address issues discovered in the process: add the C programming language to EGR 219; improve assessment of teaming in the junior-level concentration specific project courses; and improve assessment of problem solving in EGR 338 and EGR 431.

Program Assessment Results

Outcome 1: An ability to identify, specify, size and design engineering systems, components, and processes to meet needs within realistic constraints including social, political, economic, ethical, health and safety, manufacturing and/or sustainability.	
What do these results indicate about the extent to which students from this program possess the knowledge or skill reflected in Outcome 1? How do your results support this conclusion? Please use the space below to indicate whether or not each performance criterion was met and to describe components of the program you believe contributed to this result.	
Upon graduation students are well prepared to design an engineering system or product based on customer needs and realistic constraints. Students graduating from this program have eight semesters of engineering design, and the assessment supports this design outcome (outcome 1).	Outcome 1 met? Yes

Measure 1.1	Final Technical Report for all teams in Professional Design Project II. A rubric will be used to specifically highlight key components of this learning outcome.		
Performance Criterion 1.1	100% of students will achieve Minimal performance level on the EAMU Performance Vector (utilized in assessment of all engineering program courses) as determined by the outcome rubric. 80% of the student will achieve Adequate performance level on the EAMU Performance Vector as determined by the outcome rubric.	Was the Performance Criterion Met?	Yes
Results	For all design criteria in the technical report, at least 80% scored at an Accomplished level and 100% at a Developing level.		
Number of Observations Included in Assessment (e.g., number of students, papers, projects)	31 teams; each team submitted a technical report in the first and second semester. Evaluation of this outcome included specific design criteria called out in a rubric.	Proportion of <u>Target Population</u> Assessed	All graduating seniors were assessed
Data Collection Challenges or Issues [if applicable]	None		

Measure 1.2	Poster Presentation at Innovation Showcase for all teams in Professional Design Project II. A rubric will be used to specifically highlight key components of this learning outcome.		
Performance Criterion 1.2	100% of students will achieve Minimal performance level on the EAMU Performance Vector (utilized in assessment of all engineering program courses) as determined by the outcome rubric. 80% of the student will achieve Adequate performance level on the EAMU Performance Vector as determined by the outcome rubric.	Was the Performance Criterion Met?	Yes
Results	For all design criteria in the poster presentation, at least 80% scored at an Accomplished level and 100% at a Developing level.		

Number of Observations Included in Assessment (e.g., number of students, papers, projects)	We had 43 evaluations from industry and faculty members at Innovation Showcase. Multiple design criteria were assessed on the students' poster and oral presentation content. The course instructor also evaluated each poster for design content.	Proportion of Target Population Assessed	All graduating seniors were assessed
Data Collection Challenges or Issues [if applicable]	None		

Measure 1.3	Final Technical Report for all teams in Professional Design Project I. A rubric will be used to specifically assess key components of identifying and specifying customer needs		
Performance Criterion 1.3	100% of students will achieve Minimal performance level on the EAMU Performance Vector (utilized in assessment of all engineering program courses) as determined by the outcome rubric. 80% of the student will achieve Adequate performance level on the EAMU Performance Vector as determined by the outcome rubric.	Was the Performance Criterion Met? Yes	
Results	For all design criteria in the technical report addressing customer needs, at least 80% scored at an Accomplished level and 100% at a Developing level.		
Number of Observations Included in Assessment (e.g., number of students, papers, projects)	31 teams	Proportion of <u>Target Population</u> Assessed	All graduating seniors were assessed
Data Collection Challenges or Issues [if applicable]	None. A rubric assesses these criteria for the final technical report.		

*Ideally, the eligible population includes only students enrolled in your program. In cases where vital courses have students from various programs, specify when the population may include non-majors. The measure may be targeting, graduating students, alumni, students in junior level or capstone courses. The measure should be specific and the proportion should be of that group.

Outcome 2: An ability to communicate engineering findings to colleagues, clients, other stakeholders and the public in written, oral and graphical form.

What do these results indicate about the extent to which students from this program possess the knowledge or skill reflected in Outcome 2? How do your results support this conclusion? Please use the space below to indicate whether or not each performance criterion was met and to describe components of the program you believe contributed to this result.

Students have several opportunities to communicate their project status and overall project outcomes. These including industry progress reports to the industry partners and faculty mentors, design briefings to their peers, design reviews with the industry partners, and a final technical report and poster presentation. Students have several opportunities to improve their communication skills based on feedback from the instructor and their project sponsors.	Outcome 2 met? Yes
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Measure 2.1	Final Technical Report for all teams in Professional Design Project II. A rubric will be used to assess the technical writing of the report		
Performance Criterion 2.1	100% of students will achieve Minimal performance level on the EAMU Performance Vector (utilized in assessment of all engineering program courses) as determined by the outcome rubric. 80% of the student will achieve Adequate performance level on the EAMU Performance Vector as determined by the outcome rubric.	Was the Performance Criterion Met? Yes	
Results	For all communication criteria evaluated in the technical report, at least 80% scored at an Accomplished level and 100% at a developing level.		
Number of Observations Included in Assessment (e.g., number of students, papers, projects)	31 teams had multiple opportunities to submit written work and provide oral presentations. The more comprehensive deliverables, e.g. the final report and the poster presentation included rubrics to evaluate specific communication criteria.	Proportion of Target Population Assessed	All graduating seniors were assessed
Data Collection Challenges or Issues [if applicable]	None		

Measure 2.2	Poster Presentation at Innovation Showcase for all teams in Professional Design Project II. A rubric will be used to assess the ability to communicate their findings to clients, stakeholders and the general public.		
Performance Criterion 2.2	100% of students will achieve Minimal performance level on the EAMU Performance Vector (utilized in assessment of all engineering program courses) as determined by the outcome rubric. 80% of the student will achieve Adequate performance level on the EAMU Performance Vector as determined by the outcome rubric.	Was the Performance Criterion Met? Yes	
Results	100% of students achieved level 2 (Developing) as determined by the outcome rubric. 80% of students achieved level 3 (Accomplished) as determined by the outcome rubric.		

Number of Observations Included in Assessment (e.g., number of students, papers, projects)	In the spring, 31 teams presented to their peers, faculty and industry guest	Proportion of Target Population Assessed	All graduating seniors.
Data Collection Challenges or Issues [if applicable]	None		

Measure 2.3	Final Technical Report from Professional Design Project I course. A rubric will be used to assess the technical writing of the report.		
Performance Criterion 2.3	100% of students will achieve Minimal performance level on the EAMU Performance Vector (utilized in assessment of all engineering program courses) as determined by the outcome rubric. 80% of the student will achieve Adequate performance level on the EAMU Performance Vector as determined by the outcome rubric.	Was the Performance Criterion Met? Yes	
Results	For all technical writing criteria evaluated in the technical report, at least 80% scored at an Accomplished level and 100% at a Developing level.		
Number of Observations Included in Assessment (e.g., number of students, papers, projects)	31 teams	Proportion of Target Population Assessed	all graduating seniors
Data Collection Challenges or Issues [if applicable]	None		

*Ideally, the eligible population includes only students enrolled in your program. In cases where vital courses have students from various programs, specify when the population may include non-majors. The measure may be targeting, graduating students, alumni, students in junior level or capstone courses. The measure should be specific and the proportion should be of that group.

Program Self-Assessment

Please summarize how the assessment results for the 2015-16 academic year will impact your **academic program** in the coming year. Consider what the assessment data indicate are programmatic strengths or weaknesses and areas of possible development.

Overall students accomplished the design and communication outcomes detailed in the course syllabus. We will continue to emphasize communication with the industry sponsor; all project status reports will be emailed to the faculty mentor and project sponsor. We will survey our industry sponsors to seek their feedback on the overall design outcomes presented by the students and the effectiveness of the communication throughout the project.

Please summarize how the assessment results for the 2015-16 academic year will impact your **assessment process** for the coming year. Please consider revisions to your plan, sampling strategies, data collection, or any other areas.

We will continue to improve upon the rubrics used to assess the design and communication criteria for the course deliverables. We will also include a direct assessment from our industry partners.