

**Assurance of Student Learning Report  
2020-2021**

Ogden College of Science and Engineering

School of Engineering and Applied Sciences

Electrical Engineering program, #537

Assessment coordinator: Walter Collett

*Use this page to list learning outcomes, measurements, and summarize results for your program. Detailed information must be completed in the subsequent pages.*

**Student Learning Outcome 1:** ABET EAC Outcome #1: Upon graduation our students have the ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

**Instrument 1** Artifacts assessed in certain courses/sections

**Instrument 2** Senior Exit Surveys

**Instrument 3**

Based on your results, check whether the program met the goal Student Learning Outcome 1.

Met

Not Met

**Student Learning Outcome 2:** ABET EAC Outcome #2: Upon graduation, our students have the 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.

**Instrument 1** Artifacts assessed in certain courses/sections

**Instrument 2** Senior Exit Surveys

**Instrument 3**

Based on your results, check whether the program met the goal Student Learning Outcome 2.

Met

Not Met

**Student Learning Outcome 3:** ABET EAC Outcome #3: Upon graduation, our students have the ability to communicate effectively with a range of audiences.

**Instrument 1** Artifacts assessed in certain courses/sections

**Instrument 2** Senior Exit Surveys

**Instrument 3**

Based on your results, check whether the program met the goal Student Learning Outcome 3.

Met

Not Met

**Student Learning Outcome 4:** ABET EAC Outcome #4: Upon graduation, our students have the 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.

**Instrument 1** Artifacts assessed in certain courses/sections

**Instrument 2** Senior Exit Surveys

**Instrument 3**

Based on your results, check whether the program met the goal Student Learning Outcome 3.

Met

Not Met

<b>Student Learning Outcome 5:</b> ABET EAC Outcome #5: Upon graduation, our students have the 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.		
<b>Instrument 1</b>	Artifacts assessed in certain courses/sections	
<b>Instrument 2</b>	Senior Exit Surveys	
<b>Instrument 3</b>		
<b>Based on your results, check whether the program met the goal Student Learning Outcome 3.</b>		<input checked="" type="checkbox"/> <b>Met</b> <input type="checkbox"/> <b>Not Met</b>
<b>Student Learning Outcome 6:</b> ABET EAC Outcome #6: Upon graduation, our students have the ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.		
<b>Instrument 1</b>	Artifacts assessed in certain courses/sections	
<b>Instrument 2</b>	Senior Exit Surveys	
<b>Instrument 3</b>		
<b>Based on your results, check whether the program met the goal Student Learning Outcome 3.</b>		<input checked="" type="checkbox"/> <b>Met</b> <input type="checkbox"/> <b>Not Met</b>
<b>Student Learning Outcome 7:</b> ABET EAC Outcome #7: Upon graduation, our students have the ability to acquire and apply new knowledge as needed, using appropriate learning strategies.		
<b>Instrument 1</b>	Artifacts assessed in certain courses/sections	
<b>Instrument 2</b>	Senior Exit Surveys	
<b>Instrument 3</b>		
<b>Based on your results, check whether the program met the goal Student Learning Outcome 3.</b>		<input checked="" type="checkbox"/> <b>Met</b> <input type="checkbox"/> <b>Not Met</b>
<b>Program Summary (Briefly summarize the action and follow up items from your detailed responses on subsequent pages.)</b>		
<p>All Student Learning Outcomes were marked as “Met” even though the target average of 3.75 was not always attained in Measurement Instrument 2. This is because Measurement Instrument 2 is an INDIRECT measure of student learning. Measurement Instrument 1, however, is a DIRECT measure of student learning.</p> <p>The EE program met on May 13, 2021, to discuss rubric results. Few specific actions were identified as needed. Generally, however, we decided to watch to see if there is a trend of low rubric scores in a particular course over several years.</p> <p>The EE program faculty plan to conduct a course review for the week prior to Fall semester, mainly emphasizing the lecture-based courses. Recent changes to EE 300 will also be discussed.</p> <p>Regarding rubric collection for ENGR 490 and 491, which involve student teams of CE, EE and ME students, we have lately been determining rubric averages by including all students in EE-faculty-sponsored teams, not just EE students. (Rubrics have not been collected for non-EE-faculty-sponsored teams, even if EE students were on those teams.) For the coming year, however, although we will attempt to collect rubrics for all students we will extract only the EE student data to incorporate in our rubric averages. We will also attempt to collect rubrics from all project teams that include EE students.</p>		

## Student Learning Outcome 1

**Student Learning Outcome** ABET EAC Outcome #1: Upon graduation our students have the ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

**Measurement Instrument 1** Artifacts were assessed in some or all sections of the following courses: EE 300, EE 420, EE 431, EE 460, EE 473, ENGR 490 and ENGR 491.

**Criteria for Student Success** The following rubric is used when assessing student performance:

Student Learning Outcome 1: Upon graduation, our students have the ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.				
	Capstone 4	Milestones		Benchmark 1
	4	3	2	1
<b>Calculation</b> (Quantitative Literacy VALUE Rubric)	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.)	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.	Calculations are attempted but are both unsuccessful and are not comprehensive.
<b>Define Problem</b> (Problem Solving VALUE Rubric)	Demonstrates the ability to construct a clear and insightful problem statement with evidence of all relevant contextual factors.	Demonstrates the ability to construct a problem statement with evidence of most relevant contextual factors, and problem statement is adequately detailed.	Begins to demonstrate the ability to construct a problem statement with evidence of most relevant contextual factors, but problem statement is superficial.	Demonstrates a limited ability in identifying a problem statement or related contextual factors.
<b>Identify Strategies</b> (Problem Solving VALUE Rubric)	Identifies multiple approaches for solving the problem that apply within a specific context.	Identifies multiple approaches for solving the problem, only some of which apply within a specific context.	Identifies only a single approach for solving the problem that does apply within a specific context.	Identifies one or more approaches for solving the problem that do not apply within a specific context.
<b>Evaluate Potential Solutions</b> (Problem Solving VALUE Rubric)	Evaluation of solutions is deep and elegant (for example, contains thorough and insightful explanation) and includes, deeply and thoroughly, all of the following: considers history of problem, reviews logic/reasoning, examines feasibility of solution, and weighs impacts of solution.	Evaluation of solutions is adequate (for example, contains thorough explanation) and includes the following: considers history of problem, reviews logic/reasoning, examines feasibility of solution, and weighs impacts of solution.	Evaluation of solutions is brief (for example, explanation lacks depth) and includes the following: considers history of problem, reviews logic/reasoning, examines feasibility of solution, and weighs impacts of solution.	Evaluation of solutions is superficial (for example, contains cursory, surface level explanation) and includes the following: considers history of problem, reviews logic/reasoning, examines feasibility of solution, and weighs impacts of solution.

We look for a minimum average of 2.50 for each assessed junior-level course section, and 3.00 for each assessed senior-level course section. Of the courses assessed for this Outcome, EE 300, 420, 431 and 473 are considered junior-level, with the remaining courses considered senior-level.

<b>Program Success Target for this Measurement</b>	Target weighted averages are 2.50 for assessed junior-level course sections combined, and 3.00 for assessed senior-level course sections combined.	<b>Percent of Program Achieving Target Weighted Averages for course sections assessed:</b>	Junior-level course sections: 3.04 Senior-level course sections: 3.18
<b>Methods</b>	<p>Instructors choose artifacts to assess, using the above rubric, in their respective courses/sections. These artifacts will be different course section-to-course section, instructor-to-instructor, and semester-to-semester. Each item of the rubric (e.g., calculation, define problem, etc.) was weighted equally when scoring the rubric. In some cases, specific items may not have been scored.</p> <p>We looked at the average obtained for each course section assessed, with each of the junior-level course sections targeted to achieve a minimum average of 2.50, and each of the senior-level course sections targeted to achieve a minimum average of 3.00. It was observed that most assessed course sections met their targets, but a couple did not.</p> <p>We also calculated two weighted rubric averages for this Outcome this academic year: one for all assessed junior-level course sections and one for all assessed senior-level course sections. This was done to determine if, overall, the Outcome was met. The minimum weighted averages were expected to be 2.50 and 3.00, respectively. This was our Program Success Target. As indicated above, we achieved averages of 3.04 and 3.18.</p>		
<b>Measurement Instrument 2</b>	Senior Exit Surveys were given to students taking the senior design course during Fall 2020 and Spring 2021. Students were asked to “Rate your ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics” on a scale of 1 to 5 (with 5 being the highest).		
<b>Criteria for Student Success</b>			
<b>Program Success Target for this Measurement</b>	Target average of 3.75	<b>Percent of Program Achieving Target Weighted Average:</b>	3.66
<b>Methods</b>	For this year there were 9 scores total, 6 for Fall 2020 and 3 for Spring 2021. The above average of 3.66 is the average of all 9 scores received on this particular item from both semesters.		
<b>Based on your results, highlight whether the program met the goal Student Learning Outcome 1.</b>		<input checked="" type="checkbox"/> <b>Met</b>	<input type="checkbox"/> <b>Not Met</b>
<b>Actions</b> (Describe the decision-making process and actions for program improvement. The actions should include a timeline.)			
(NOTE: Student Learning Outcome 1 was marked as “Met” even though the target average of 3.75 was not attained in Measurement Instrument 2. This is because Measurement Instrument 2 is an INDIRECT measure of student learning. Measurement Instrument 1, however, is a DIRECT measure of student learning.)			
The EE program met on May 13, 2021, to discuss rubric results. We do not see a need to address the rubric scores for this particular Outcome, except to watch to see if there is a trend of low scores in a particular course over several years.			
Problems that allow more SLO1 rubric items (e.g., calculation, define problem, etc.) to be considered in EE 420 and EE 473 may be given in the coming year.			
<b>Follow-Up</b> (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)			
The EE program assessment plan calls for rubric collection each semester (fall and spring), and a meeting of EE faculty to discuss the rubric results.			
<b>Next Assessment Cycle Plan</b> (Please describe your assessment plan timetable for this outcome)			
See above.			

## Student Learning Outcome 2

<b>Student Learning Outcome</b>	ABET EAC Outcome #2: Upon graduation, our students have the 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.																																																
<b>Measurement Instrument 1</b>	Artifacts were assessed in some or all sections of the following courses: EE 300, ENGR 490, ENGR 491																																																
<b>Criteria for Student Success</b>	<p>The following rubric is used when assessing student performance:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th colspan="5" style="text-align: center; background-color: #e0e0e0;">Student Learning Outcome 2: Upon graduation, our students have the ability to apply engineering design to produce solutions that meet specific needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.</th> </tr> <tr> <th style="width: 20%;"></th> <th style="width: 15%; text-align: center;">Capstone 4</th> <th colspan="2" style="width: 40%; text-align: center;">Milestones</th> <th style="width: 25%; text-align: center;">Benchmark 1</th> </tr> <tr> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> <td></td> <td></td> </tr> </thead> <tbody> <tr> <td><b>Acquiring Competencies</b> (Creative Thinking VALUE Rubric)</td> <td>Reflect: Evaluates creative process and product using domain-appropriate criteria.</td> <td>Create: Creates an entirely new object, solution or idea that is appropriate to the domain.</td> <td>Adapt: Successfully adapts an appropriate exemplar to his/her own specifications.</td> <td>Model: Successfully reproduces an appropriate exemplar.</td> </tr> <tr> <td><b>Solving Problems</b> (Creative Thinking VALUE Rubric)</td> <td>Not only develops a logical, consistent plan to solve problem, but recognizes consequences of solution and can articulate reason for choosing solution.</td> <td>Having selected from among alternatives develops a logical, consistent plan to solve the problem.</td> <td>Considers and rejects less acceptable approaches to solving problem.</td> <td>Only a single approach is considered and is used to solve the problem.</td> </tr> <tr> <td><b>Embracing Contradictions</b> (Creative Thinking VALUE Rubric)</td> <td>Integrates alternate, divergent, or contradictory perspectives or ideas fully.</td> <td>Incorporates alternate, divergent, or contradictory perspectives or ideas in a exploratory way.</td> <td>Includes (recognizes the value of) alternate, divergent, or contradictory perspectives or ideas in a small way.</td> <td>Acknowledges (mentions in passing) alternate, divergent, or contradictory perspectives or ideas.</td> </tr> <tr> <td><b>Connecting, Synthesizing, Transforming</b> (Creative Thinking VALUE Rubric)</td> <td>Transforms ideas or solutions into entirely new forms.</td> <td>Synthesizes ideas or solutions into a coherent whole.</td> <td>Connects ideas or solutions in novel ways.</td> <td>Recognizes existing connections among ideas or solutions.</td> </tr> <tr> <td><b>Implement Solutions</b> (Problem Solving VALUE Rubric)</td> <td>Implements the solution in a manner that addresses thoroughly and deeply multiple contextual factors of the problem.</td> <td>Implements the solution in a manner that addresses multiple contextual factors of the problem in a surface manner.</td> <td>Implements the solution in a manner that addresses the problem statement but ignores relevant contextual factors.</td> <td>Implements the solution in a manner that does not directly address the problem statement.</td> </tr> <tr> <td><b>Identifying specific project objectives, standards, and constraints based on general project requirements</b></td> <td>All important objectives, standards, and constraints are identified and clearly implemented</td> <td>Most important objectives, standards, and constraints are identified and implemented with minor deficiencies</td> <td>Some objectives, standards, and constraints are identified with some deficiencies</td> <td>Objectives, standards, and/or constraints not clearly identified or contain significant deficiencies</td> </tr> </tbody> </table> <p style="text-align: center;"> </p> <p>We look for a minimum average of 2.50 for each assessed junior-level course section, and 3.00 for each assessed senior-level course section. Of the courses assessed for this Outcome, EE 300 is considered junior-level, with the remaining courses considered senior-level</p>				Student Learning Outcome 2: Upon graduation, our students have the ability to apply engineering design to produce solutions that meet specific needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.						Capstone 4	Milestones		Benchmark 1		3	2			<b>Acquiring Competencies</b> (Creative Thinking VALUE Rubric)	Reflect: Evaluates creative process and product using domain-appropriate criteria.	Create: Creates an entirely new object, solution or idea that is appropriate to the domain.	Adapt: Successfully adapts an appropriate exemplar to his/her own specifications.	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<b>Program Success Target for this Measurement</b>	Target weighted averages are 2.50 for assessed junior-level course sections combined, and 3.00 for assessed senior-level course sections combined.	<b>Percent of Program Achieving Target</b>	Junior-level course sections: 2.60 Senior-level course sections: 3.32																																														
		<b>Weighted Averages for course sections assessed:</b>																																															

<b>Methods</b>	<p>Instructors choose artifacts to assess, using the above rubric, in their respective courses/sections. These artifacts will be different course section-to-course section, instructor-to-instructor, and semester-to-semester. Each item of the rubric (e.g., acquiring competencies, solving problems, etc.) was weighted equally when scoring the rubric. In some cases, specific items may not have been scored.</p> <p>We looked at the average obtained for each course section assessed, with each of the junior-level course sections targeted to achieve a minimum average of 2.50, and each of the senior-level course sections targeted to achieve a minimum average of 3.00. It was observed that all assessed course sections met their targets.</p> <p>We also calculated two weighted rubric averages for this Outcome this academic year: one for all assessed junior-level course sections and one for all assessed senior-level course sections. This was done to determine if, overall, the Outcome was met. The minimum weighted averages were expected to be 2.50 and 3.00, respectively. This was our Program Success Target. As indicated above, we achieved averages of 2.60 and 3.32.</p>		
<b>Measurement Instrument 2</b>	Senior Exit Surveys were given to students taking the senior design course during Fall 2020 and Spring 2021. Students were asked to “Rate your ability to apply engineering design to produce solutions that meet specific needs with consideration for public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors” on a scale of 1 to 5 (with 5 being the highest).		
<b>Criteria for Student Success</b>			
<b>Program Success Target for this Measurement</b>	Target average of 3.75	<b>Percent of Program Achieving Target</b> <b>Weighted Average:</b>	3.55
<b>Methods</b>	For this year there were 9 scores total, 6 for Fall 2020 and 3 for Spring 2021. The above average of 3.55 is the average of all 9 scores received on this particular item from both semesters.		
<b>Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 2.</b>		<input checked="" type="checkbox"/> <b>Met</b>	<input type="checkbox"/> <b>Not Met</b>
<b>Actions</b> (Describe the decision-making process and actions planned for program improvement. The actions should include a timeline.)			
(NOTE: Student Learning Outcome 2 was marked as “Met” even though the target average of 3.75 was not attained in Measurement Instrument 2. This is because Measurement Instrument 2 is an INDIRECT measure of student learning. Measurement Instrument 1, however, is a DIRECT measure of student learning.)			
The EE program met on May 13, 2021, to discuss rubric results. We did not identify any actions required for this Outcome this year.			
<b>Follow-Up</b> (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)			
The EE program assessment plan calls for rubric collection each semester (fall and spring), and a meeting of EE faculty to discuss the rubric results.			
<b>Next Assessment Cycle Plan</b> (Please describe your assessment plan timetable for this outcome)			
See above.			









	<p>minimum average of 2.50, and each of the senior-level course sections targeted to achieve a minimum average of 3.00. It was observed that most assessed course sections met their targets, but some did not.</p> <p>We also calculated two sets of weighted rubric averages for this Outcome this academic year: one set for all assessed junior-level course sections and one set for all assessed senior-level course sections. This was done to determine if, overall, the Outcome was met. The minimum weighted averages were expected to be 2.50 and 3.00, respectively. This was our Program Success Target. As indicated above, we achieved averages of 3.01/3.33 (oral/written) and 3.21/3.10 (oral/written).</p>		
<b>Measurement Instrument 2</b>	Senior Exit Surveys were given to students taking the senior design course during Fall 2020 and Spring 2021. Students were asked to “Rate your ability to communicate effectively with range of audiences” on a scale of 1 to 5 (with 5 being the highest).		
<b>Criteria for Student Success</b>			
<b>Program Success Target for this Measurement</b>	Target average of 3.75	<b>Percent of Program Achieving Target</b>	3.78
		<b>Weighted Average:</b>	
<b>Methods</b>	For this year there were 9 scores total, 6 for Fall 2020 and 3 for Spring 2021. The above average of 3.78 is the average of all 9 scores received on this particular item from both semesters.		
<b>Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 3.</b>			<input checked="" type="checkbox"/> <b>Met</b>
			<input type="checkbox"/> <b>Not Met</b>
<b>Actions</b> (Describe the decision-making process and actions for program improvement. The actions should include a timeline.)			
The EE program met on May 13, 2021, to discuss rubric results. We do not see a need to address the rubric scores for this particular Outcome, except to watch to see if there is a trend of low scores in a particular course over several years.			
<b>Follow-Up</b> (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)			
The EE program assessment plan calls for rubric collection each semester (fall and spring), and a meeting of EE faculty to discuss the rubric results.			
<b>Next Assessment Cycle Plan</b> (Please describe your assessment plan timetable for this outcome)			
See above.			

### Student Learning Outcome 4

**Student Learning Outcome** ABET EAC Outcome #4: Upon graduation, our students have the 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.

**Measurement Instrument 1** Artifacts were assessed in some or all sections of the following courses: EE 300, ENGR 490, ENGR 491

**Criteria for Student Success** The following rubric is used when assessing student performance:

Student Learning Outcome 4: Upon graduation, our students have the 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					
	Capstone 4	Milestones		Benchmark 1	
	3	2			
<b>Ethical Issue Recognition (Ethical Reasoning VALUE Rubric)</b>	Student can recognize ethical issues when presented in a complex, multilayered (gray) context AND can recognize <u>crossrelationships</u> among the issues.	Student can recognize ethical issues when issues are presented in a complex, multilayered (gray) context OR can grasp <u>crossrelationships among the issues</u> .	Student can recognize basic and obvious ethical issues and grasp (incompletely) the complexities or interrelationships among the issues.	Student can recognize basic and obvious ethical issues but fails to grasp complexity or <u>interrelationships</u> .	
<b>Application of Ethical Perspectives/Concepts (Ethical Reasoning VALUE Rubric)</b>	Student can independently apply ethical perspectives/concepts to an ethical question, accurately, and is able to consider full <u>implications</u> of the application.	Student can independently (to a new example) apply ethical perspectives/ concepts to an ethical question, accurately, but does not consider the specific <u>implications</u> of the application.	Student can apply ethical perspectives/concepts to an ethical question, independently (to a new example) and the <u>application</u> is inaccurate.	Student can apply ethical perspectives/ concepts to an ethical question with support (using examples, in a class, in a group, or a fixed-choice setting) but is unable to apply ethical perspectives/concepts <u>independently</u> (to a new example.).	
<b>Responsibility of Engineer</b>	Given a situation, clearly articulates the responsibilities of the engineer in a global and societal context with all major issues addressed	Given a situation, generally articulates the responsibilities of the engineer in a global and societal context with most major issues addressed	Given a situation, attempts to articulate the responsibilities of the engineer in a global and societal context but misses several key points	Has not grasped the role of a responsible engineer in a global society	
<b>Cultural Impact of Solutions</b>	Clearly articulates the impact of engineering solutions in a global society	Can basically articulate the impact of engineering solutions in a global society	Has some ability to articulate the impact of engineering solutions in a global society	Cannot articulate the impact of engineering solutions in a global society	
<b>Application of appropriate code of ethics</b>	Clear link of dilemma and resolution (s) to an appropriate code of ethics	Link between dilemma and final resolution to appropriate code of ethics	Superficial discussion of a code of ethics to dilemma and resolution	Code of ethic not incorporated into discussion of dilemma or resolution	

We look for a minimum average of 2.50 for each assessed junior-level course section, and 3.00 for each assessed senior-level course section. Of the courses assessed for this Outcome, EE 300 is considered junior-level, with the remaining courses considered senior-level.

<b>Program Success Target for this Measurement</b>	Target weighted averages are 2.50 for assessed junior-level course sections combined, and 3.00 for assessed senior-level course sections combined.	<b>Percent of Program Achieving Target Weighted Averages for course sections assessed:</b>	Junior-level course section: 3.52 Senior-level course sections: 3.66
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**Methods** Instructors choose artifacts to assess, using the above rubric, in their respective courses/sections. These artifacts will be different course section-to-course section, instructor-to-instructor, and semester-to-semester. Each item of the rubric (e.g., ethical issue recognition, application of ethical perspectives/concepts, etc.) was weighted equally when scoring the rubric. In some cases, specific items may not have been scored.

We looked at the average obtained for each course section assessed, with each of the junior-level course sections targeted to achieve a minimum average of 2.50, and each of the senior-level course sections targeted to achieve a minimum average of 3.00. It was observed that

	<p>all assessed course sections met their targets.</p> <p>We also calculated two weighted rubric averages for this Outcome this academic year: one for all assessed junior-level course sections and one for all assessed senior-level course sections. This was done to determine if, overall, the Outcome was met. The minimum weighted averages were expected to be 2.50 and 3.00, respectively. This was our Program Success Target. As indicated above, we achieved averages of 3.52 and 3.66.</p>		
<b>Measurement Instrument 2</b>	<p>Senior Exit Surveys were given to students taking the senior design course during Fall 2020 and Spring 2021. Students were asked to “Rate your ability to 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” on a scale of 1 to 5 (with 5 being the highest).</p>		
<b>Criteria for Student Success</b>			
<b>Program Success Target for this Measurement</b>	Target average of 3.75	<b>Percent of Program Achieving Target</b>	4.00
		<b>Weighted Average:</b>	
<b>Methods</b>	<p>For this year there were 9 scores total, 6 for Fall 2020 and 3 for Spring 2021. The above average of 4.00 is the average of all 9 scores received on this particular item from both semesters.</p>		
<b>Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 3.</b>			<input checked="" type="checkbox"/> <b>Met</b>
<input type="checkbox"/> <b>Not Met</b>			
<b>Actions</b> (Describe the decision-making process and actions for program improvement. The actions should include a timeline.)			
<p>The EE program met on May 13, 2021, to discuss rubric results. Ethics has been taken out of ENGR 490 for the upcoming fall, so will need to be taken out of the assessment plan. No other actions required for this Outcome.</p>			
<b>Follow-Up</b> (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)			
<p>The EE program assessment plan calls for rubric collection each semester (fall and spring), and a meeting of EE faculty to discuss the rubric results.</p>			
<b>Next Assessment Cycle Plan</b> (Please describe your assessment plan timetable for this outcome)			
<p>See above.</p>			



	assessed junior-level course sections combined, and 3.00 for assessed senior-level course sections combined.	<del>Achieving Target</del> <b>Weighted Averages for course sections assessed:</b>	Senior-level course sections: 3.23
<b>Methods</b>	<p>Instructors choose artifacts to assess, using the above rubric, in their respective courses/sections. These artifacts will be different course section-to-course section, instructor-to-instructor, and semester-to-semester. Each item of the rubric (e.g., contributes to team meetings, facilitates the contributions of team members, etc.) was weighted equally when scoring the rubric. In some cases, specific items may not have been scored.</p> <p>We looked at the average obtained for each course section assessed, with each of the junior-level course sections targeted to achieve a minimum average of 2.50, and each of the senior-level course sections targeted to achieve a minimum average of 3.00. It was observed that most assessed course sections met their targets, but some did not.</p> <p>We also calculated two weighted rubric averages for this Outcome this academic year: one for all assessed junior-level course sections and one for all assessed senior-level course sections. This was done to determine if, overall, the Outcome was met. The minimum weighted averages were expected to be 2.50 and 3.00, respectively. This was our Program Success Target. As indicated above, we achieved averages of 3.16 and 3.23.</p>		
<b>Measurement Instrument 2</b>	Senior Exit Surveys were given to students taking the senior design course during Fall 2020 and Spring 2021. Students were asked to “Rate your 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” on a scale of 1 to 5 (with 5 being the highest).		
<b>Criteria for Student Success</b>			
<b>Program Success Target for this Measurement</b>	Target average of 3.75	<del>Percent of Program Achieving Target</del> <b>Weighted Average:</b>	3.80
<b>Methods</b>	For this year there were 10 scores total, 7 for Fall 2020 and 3 for Spring 2021. The above average of 3.80 is the average of all 10 scores received on this particular item from both semesters.		
<b>Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 3.</b>			<input checked="" type="checkbox"/> <b>Met</b> <input type="checkbox"/> <b>Not Met</b>
<b>Actions</b> (Describe the decision-making process and actions for program improvement. The actions should include a timeline.)			
The EE program met on May 13, 2021, to discuss rubric results. We do not see a need to address the rubric scores for this particular Outcome, except to watch to see if there is a trend of low scores in a particular course over several years.			
<b>Follow-Up</b> (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)			
The EE program assessment plan calls for rubric collection each semester (fall and spring), and a meeting of EE faculty to discuss the rubric results.			
<b>Next Assessment Cycle Plan</b> (Please describe your assessment plan timetable for this outcome)			
See above.			

### Student Learning Outcome 6

<b>Student Learning Outcome</b>	ABET EAC Outcome #6: Upon graduation, our students have the ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.																																										
<b>Measurement Instrument 1</b>	Artifacts were assessed in some or all sections of the following courses: EE 431, EE 460, ENGR 490 and ENGR 491																																										
<b>Criteria for Student Success</b>	<p>The following rubric is used when assessing student performance:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th colspan="5" style="text-align: left; padding: 5px;">Student Learning Outcome 6: Upon graduation, our students have the ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions</th> </tr> <tr> <th style="width: 20%;"></th> <th style="width: 15%; text-align: center;">Capstone 4</th> <th colspan="2" style="width: 40%; text-align: center;">Milestones</th> <th style="width: 25%; text-align: center;">Benchmark 1</th> </tr> <tr> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> <td></td> <td></td> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Design Process (Inquiry and Analysis VALUE Rubric)</td> <td style="padding: 5px;">All elements of the methodology or theoretical framework are skillfully developed. Appropriate methodology or theoretical frameworks may be synthesized from across disciplines or from relevant subdisciplines.</td> <td style="padding: 5px;">Critical elements of the methodology or theoretical framework are appropriately developed, however, more subtle elements are ignored or unaccounted for.</td> <td style="padding: 5px;">Critical elements of the methodology or theoretical framework are missing, incorrectly developed, or unfocused.</td> <td style="padding: 5px;">Inquiry design demonstrates a misunderstanding of the methodology or theoretical framework.</td> </tr> <tr> <td style="padding: 5px;">Conclusions (Inquiry and Analysis VALUE Rubric)</td> <td style="padding: 5px;">States a conclusion that is a logical extrapolation from the inquiry findings.</td> <td style="padding: 5px;">States a conclusion focused solely on the inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings.</td> <td style="padding: 5px;">States a general conclusion that, because it is so general, also applies beyond the scope of the inquiry findings.</td> <td style="padding: 5px;">States an ambiguous, illogical, or unsupported conclusion from inquiry findings.</td> </tr> <tr> <td style="padding: 5px;">Compliance with Standards</td> <td style="padding: 5px;">Test performed in full compliance with applicable standard</td> <td style="padding: 5px;">Test performed in general compliance with standard with only minor procedural error that does not completely invalidate the result</td> <td style="padding: 5px;">Test performed in general compliance with standard, but a procedural error resulted in faulty results</td> <td style="padding: 5px;">Test not performed in compliance with standard and results invalid</td> </tr> <tr> <td style="padding: 5px;">Application of Results</td> <td style="padding: 5px;">Results of experiment applied completely and accurately to the situation</td> <td style="padding: 5px;">Results applied generally/conceptually correct with only a minor error</td> <td style="padding: 5px;">Results applied generally/conceptually correct with a few errors</td> <td style="padding: 5px;">Results not applied correctly to the situation</td> </tr> <tr> <td style="padding: 5px;">Designing an experiment or experimental procedure</td> <td style="padding: 5px;">Students select and/or design all appropriate test(s) or process(es) to the situation at hand.</td> <td style="padding: 5px;">Students generally select and/or design the appropriate test(s) or process (es) to the situation at hand.</td> <td style="padding: 5px;">Students select or design some appropriate tests or processes, with a notable error or omission.</td> <td style="padding: 5px;">Students select or design some appropriate tests or processes, with significant errors or omissions.</td> </tr> </tbody> </table> <p>We look for a minimum average of 2.50 for each assessed junior-level course section, and 3.00 for each assessed senior-level course section. Of the courses assessed for this Outcome, EE 431 is considered junior-level, with the remaining courses considered senior-level.</p>			Student Learning Outcome 6: Upon graduation, our students have the ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions						Capstone 4	Milestones		Benchmark 1		3	2			Design Process (Inquiry and Analysis VALUE Rubric)	All elements of the methodology or theoretical framework are skillfully developed. Appropriate methodology or theoretical frameworks may be synthesized from across disciplines or from relevant subdisciplines.	Critical elements of the methodology or theoretical framework are appropriately developed, however, more subtle elements are ignored or unaccounted for.	Critical elements of the methodology or theoretical framework are missing, incorrectly developed, or unfocused.	Inquiry design demonstrates a misunderstanding of the methodology or theoretical framework.	Conclusions (Inquiry and Analysis VALUE Rubric)	States a conclusion that is a logical extrapolation from the inquiry findings.	States a conclusion focused solely on the inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings.	States a general conclusion that, because it is so general, also applies beyond the scope of the inquiry findings.	States an ambiguous, illogical, or unsupported conclusion from inquiry findings.	Compliance with Standards	Test performed in full compliance with applicable standard	Test performed in general compliance with standard with only minor procedural error that does not completely invalidate the result	Test performed in general compliance with standard, but a procedural error resulted in faulty results	Test not performed in compliance with standard and results invalid	Application of Results	Results of experiment applied completely and accurately to the situation	Results applied generally/conceptually correct with only a minor error	Results applied generally/conceptually correct with a few errors	Results not applied correctly to the situation	Designing an experiment or experimental procedure	Students select and/or design all appropriate test(s) or process(es) to the situation at hand.	Students generally select and/or design the appropriate test(s) or process (es) to the situation at hand.	Students select or design some appropriate tests or processes, with a notable error or omission.	Students select or design some appropriate tests or processes, with significant errors or omissions.
Student Learning Outcome 6: Upon graduation, our students have the ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions																																											
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Conclusions (Inquiry and Analysis VALUE Rubric)	States a conclusion that is a logical extrapolation from the inquiry findings.	States a conclusion focused solely on the inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings.	States a general conclusion that, because it is so general, also applies beyond the scope of the inquiry findings.	States an ambiguous, illogical, or unsupported conclusion from inquiry findings.																																							
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<b>Program Success Target for this Measurement</b>	Target weighted averages are 2.50 for assessed junior-level course sections combined, and 3.00 for assessed senior-level course sections combined.	<b>Percent of Program Achieving Target Weighted Averages for course sections assessed:</b>	Junior-level course sections: 2.85 Senior-level course sections: 3.14																																								



<b>Methods</b>	<p>Instructors choose artifacts to assess, using the above rubric, in their respective courses/sections. These artifacts will be different course section-to-course section, instructor-to-instructor, and semester-to-semester. Each item of the rubric (e.g., design process, conclusions, etc.) was weighted equally when scoring the rubric. In some cases, specific items may not have been scored.</p> <p>We looked at the average obtained for each course section assessed, with each of the junior-level course sections targeted to achieve a minimum average of 2.50, and each of the senior-level course sections targeted to achieve a minimum average of 3.00. It was observed that most assessed course sections met their targets, but one did not.</p> <p>We also calculated two weighted rubric averages for this Outcome this academic year: one for all assessed junior-level course sections and one for all assessed senior-level course sections. This was done to determine if, overall, the Outcome was met. The minimum weighted averages were expected to be 2.50 and 3.00, respectively. This was our Program Success Target. As indicated above, we achieved averages of 2.85 and 3.14.</p>		
<b>Measurement Instrument 2</b>	Senior Exit Surveys were given to students taking the senior design course during Fall 2020 and Spring 2021. Students were asked to “Rate your ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions” on a scale of 1 to 5 (with 5 being the highest).		
<b>Criteria for Student Success</b>			
<b>Program Success Target for this Measurement</b>	Target average of 3.75	<b>Percent of Program Achieving Target</b> <b>Weighted Average:</b>	3.60
<b>Methods</b>	For this year there were 10 scores total, 7 for Fall 2020 and 3 for Spring 2021. The above average of 3.60 is the average of all 10 scores received on this particular item from both semesters.		
<b>Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 3.</b>		<input checked="" type="checkbox"/> <b>Met</b>	<input type="checkbox"/> <b>Not Met</b>
<b>Actions</b> (Describe the decision-making process and actions for program improvement. The actions should include a timeline.)			
(NOTE: Student Learning Outcome 6 was marked as “Met” even though the target average of 3.75 was not attained in Measurement Instrument 2. This is because Measurement Instrument 2 is an INDIRECT measure of student learning. Measurement Instrument 1, however, is a DIRECT measure of student learning.)			
The EE program met on May 13, 2021, to discuss rubric results. We did not identify any actions required for this Outcome this year, except to watch to see if there is a trend of low scores in a particular course over several years.			
<b>Follow-Up</b> (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)			
The EE program assessment plan calls for rubric collection each semester (fall and spring), and a meeting of EE faculty to discuss the rubric results.			
<b>Next Assessment Cycle Plan</b> (Please describe your assessment plan timetable for this outcome)			
See above.			

### Student Learning Outcome 7

<b>Student Learning Outcome</b>	ABET EAC Outcome #7: Upon graduation, our students have the ability to acquire and apply new knowledge as needed, using appropriate learning strategies.																																	
<b>Measurement Instrument 1</b>	Artifacts were assessed in some or all sections of the following courses: EE 300, ENGR 490, ENGR 491																																	
<b>Criteria for Student Success</b>	The following rubric is used when assessing student performance:																																	
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="5" style="text-align: center;">Student Learning Outcome 7: Upon graduation, our students have the ability to acquire and apply new knowledge as needed, using appropriate learning strategies.</td> </tr> <tr> <td style="width: 15%;"></td> <td style="width: 15%; text-align: center;"><b>Capstone</b></td> <td colspan="2" style="width: 40%; text-align: center;"><b>Milestones</b></td> <td style="width: 30%; text-align: center;"><b>Benchmark</b></td> </tr> <tr> <td></td> <td style="text-align: center;"><b>4</b></td> <td style="text-align: center;"><b>3</b></td> <td style="text-align: center;"><b>2</b></td> <td style="text-align: center;"><b>1</b></td> </tr> <tr> <td><b>Independence (Foundations and Skills for Lifelong Learning VALUE Rubric)</b></td> <td>Educational interests and pursuits exist and flourish outside classroom requirements. Knowledge and/or experiences are pursued independently.</td> <td>Beyond classroom requirements, pursues substantial, additional knowledge and/or actively pursues independent educational experiences.</td> <td>Beyond classroom requirements, pursues additional knowledge and/or shows interest in pursuing independent educational experiences.</td> <td>Begins to look beyond classroom requirements, showing interest in pursuing knowledge independently.</td> </tr> <tr> <td><b>Transfer (Foundations and Skills for Lifelong Learning VALUE Rubric)</b></td> <td>Makes explicit references to previous learning and applies in an innovative (new and creative) way that knowledge and those skills to demonstrate comprehension and performance in novel situations.</td> <td>Makes references to previous learning and shows evidence of applying that knowledge and those skills to demonstrate comprehension and performance in novel situations.</td> <td>Makes references to previous learning and attempts to apply that knowledge and those skills to demonstrate comprehension and performance in novel situations.</td> <td>Makes vague references to previous learning but does not apply knowledge and skills to demonstrate comprehension and performance in novel situations.</td> </tr> <tr> <td><b>Initiative (Foundations and Skills for Lifelong Learning VALUE Rubric)</b></td> <td>Completes required work, generates and pursues opportunities to expand knowledge, skills, and abilities.</td> <td>Completes required work, identifies and pursues opportunities to expand knowledge, skills, and abilities.</td> <td>Completes required work and identifies opportunities to expand knowledge, skills, and abilities.</td> <td>Completes required work.</td> </tr> </table>				Student Learning Outcome 7: Upon graduation, our students have the ability to acquire and apply new knowledge as needed, using appropriate learning strategies.						<b>Capstone</b>	<b>Milestones</b>		<b>Benchmark</b>		<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>Independence (Foundations and Skills for Lifelong Learning VALUE Rubric)</b>	Educational interests and pursuits exist and flourish outside classroom requirements. Knowledge and/or experiences are pursued independently.	Beyond classroom requirements, pursues substantial, additional knowledge and/or actively pursues independent educational experiences.	Beyond classroom requirements, pursues additional knowledge and/or shows interest in pursuing independent educational experiences.	Begins to look beyond classroom requirements, showing interest in pursuing knowledge independently.	<b>Transfer (Foundations and Skills for Lifelong Learning VALUE Rubric)</b>	Makes explicit references to previous learning and applies in an innovative (new and creative) way that knowledge and those skills to demonstrate comprehension and performance in novel situations.	Makes references to previous learning and shows evidence of applying that knowledge and those skills to demonstrate comprehension and performance in novel situations.	Makes references to previous learning and attempts to apply that knowledge and those skills to demonstrate comprehension and performance in novel situations.	Makes vague references to previous learning but does not apply knowledge and skills to demonstrate comprehension and performance in novel situations.	<b>Initiative (Foundations and Skills for Lifelong Learning VALUE Rubric)</b>	Completes required work, generates and pursues opportunities to expand knowledge, skills, and abilities.	Completes required work, identifies and pursues opportunities to expand knowledge, skills, and abilities.	Completes required work and identifies opportunities to expand knowledge, skills, and abilities.	Completes required work.
	Student Learning Outcome 7: Upon graduation, our students have the ability to acquire and apply new knowledge as needed, using appropriate learning strategies.																																	
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We look for a minimum average of 2.50 for each assessed junior-level course section, and 3.00 for each assessed senior-level course section. Of the courses assessed for this Outcome, EE 300 is considered junior-level, with the remaining courses considered senior-level.																																		
<b>Program Success Target for this Measurement</b>	Target weighted averages are 2.50 for assessed junior-level course sections combined, and 3.00 for assessed senior-level course sections combined.	<b>Percent of Program Achieving Target Weighted Averages for course sections assessed:</b>	Junior-level course sections: 3.25 Senior-level course sections: 3.05																															
<b>Methods</b>	Instructors choose artifacts to assess, using the above rubric, in their respective courses/sections. These artifacts will be different course section-to-course section, instructor-to-instructor, and semester-to-semester. Each item of the rubric (e.g., independence, transfer, etc.) was weighted equally when scoring the rubric. In some cases, specific items may not have been scored.																																	
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	<p>most assessed course sections met their targets, but some did not.</p> <p>We also calculated two weighted rubric averages for this Outcome this academic year: one for all assessed junior-level course sections and one for all assessed senior-level course sections. This was done to determine if, overall, the Outcome was met. The minimum weighted averages were expected to be 2.50 and 3.00, respectively. This was our Program Success Target. As indicated above, we achieved averages of 3.25 and 3.05.</p>		
<b>Measurement Instrument 2</b>	Senior Exit Surveys were given to students taking the senior design course during Fall 2020 and Spring 2021. Students were asked to “Rate your ability to acquire and apply new knowledge as needed, using appropriate learning strategies” on a scale of 1 to 5 (with 5 being the highest).		
<b>Criteria for Student Success</b>			
<b>Program Success Target for this Measurement</b>	Target average of 3.75	<b>Percent of Program Achieving Target</b>	3.60
		<b>Weighted Average:</b>	
<b>Methods</b>	For this year there were 10 scores total, 7 for Fall 2020 and 3 for Spring 2021. The above average of 3.60 is the average of all 10 scores received on this particular item from both semesters.		
<b>Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 3.</b>			<input checked="" type="checkbox"/> <b>Met</b>
<input type="checkbox"/> <b>Not Met</b>			
<b>Actions</b> (Describe the decision-making process and actions for program improvement. The actions should include a timeline.)			
(NOTE: Student Learning Outcome 7 was marked as “Met” even though the target average of 3.75 was not attained in Measurement Instrument 2. This is because Measurement Instrument 2 is an INDIRECT measure of student learning. Measurement Instrument 1, however, is a DIRECT measure of student learning.)			
The EE program met on May 13, 2021, to discuss rubric results. We decided to consult our industrial liaison for information regarding the Independence criterion for the upcoming year, and include that information in our next ABET self-study report. Also, we mean to include the Independence criterion into the Senior Exit Survey. The program faculty did not identify any other actions required for this Outcome this year, except to watch to see if there is a trend of low scores in a particular course over several years.			
<b>Follow-Up</b> (Provide your timeline for follow-up. If follow-up has occurred, describe how the actions above have resulted in program improvement.)			
The EE program assessment plan calls for rubric collection each semester (fall and spring), and a meeting of EE faculty to discuss the rubric results.			
<b>Next Assessment Cycle Plan</b> (Please describe your assessment plan timetable for this outcome)			
See above.			