Program Plan and Findings: Four Column Layout

Program (CEAT) - ECE - Computer Engineering (BSCP) - 467

Program Mission Statement: The mission of the School of Electrical and Computer Engineering is to provide a high-quality, comprehensive electrical and computer engineering education for both undergraduate and graduate degree seeking students. The primary forms of educational delivery are classroom instruction, laboratory experiences utilizing both hardware and software technologies, and research experiences. To this end, the School offers the following degrees: Bachelor of Science in Electrical Engineering (BSEE), Bachelor of Science in Computer Engineering (BSCpE), Master of Science in Electrical Engineering (MSEE), Master of Engineering in Electrical Engineering (MEngEE), and Doctorate in Electrical Engineering (PhDEE).
The School is chartered to perform both basic and applied research in the broad areas of electrical and computer engineering. The School acquires external support to establish research enterprises for student-centric discovery that culminates in the publication of findings in international, peer-reviewed journals and conference proceedings of the highest reputation.
Ancillary to the teaching and research mission of the School, the faculty of the School engage in extramural activities of service, extension, and outreach by serving the School, College, or University on internal committees, organizing conferences, developing short courses, reviewing papers, participating on professional committees, and the like.

Program Information

2019 - 2020

Program Information

Assessment Coordinator's Name: Keith A. Teague, Professor
Assessment Coordinator's E-mail Address: keith.teague@okstate.edu
Number of Students Enrolled in the Program: 152
Total Number of Students Graduated: 22
Number of Student Graduates from Stillwater Campus: 22
Were university assessment funds used by the department/program for assessment activities?: No
If yes, describe how funds were used and the contribution the funds had on the assessment process: n/a
Number of Student Graduates from Tulsa Campus: 0

Annual Executive Summaries

2019 - 2020

Program Assessment Coordinator: Keith A. Teague, Professor

Plan Review and Approval

Date Current Plan Was Reviewed and Approved: 09/15/2020
Date of Future Plan Review and Approval: 09/15/2025

Summary of Assessment Findings

Describe overall assessment findings and faculty members' interpretation of the assessment results: Overall results suggest the BS degree students in Electrical Engineering and Computer Engineering are meeting or exceeding our expectations for Student Outcomes.

This was the second full year for our new Student Outcomes specified by our accrediting agency, ABET, Inc., which changed from eleven outcomes that were previously in effect for approximately 19 years to a new set of seven outcomes. 2019-20 was the first year for which the new outcomes were fully in effect for an entire academic year. Although the new outcomes overlap the old ones in many cases, changes in wording and requirements have altered our assessment methods during the past two years. These methods continue to evolve as we gather data and experience.

Dissemination of Findings

Describe the individual(s) or committee responsible for reviewing and interpreting assessment data: Assessment data for the two undergraduate programs, Electrical Engineering and Computer Engineering, are collected, reviewed, and acted upon by the ECE Undergraduate Program and Assessment Committee, which is responsible for oversight of the BS degree programs in the School of Electrical and Computer Engineering. From a practical perspective, data are initially reviewed by the committee chair, Dr. Keith Teague, and the School Head, Dr. Jeffrey L. Young. The overall committee is brought in when important decisions need to be made. Data are reported to the overall faculty of the School typically twice yearly at a scheduled faculty meeting. When action is deemed necessary, a recommendation is generated to the School Head who in consultation with the faculty is ultimately responsible for further evaluation and possible action. Assessment data are reported to ABET, Inc., as part of our activities every six years in conjunction with our program reaccreditation.

Describe the process for sharing and discussing assessment findings with program faculty: Assessment information is shared with the faculty typically twice annually as part of regularly scheduled faculty meetings and/or the annual fall faculty retreat. The faculty are asked to review and approve the information presented. Annual review of the Program Educational Objectives and Student Outcomes is also performed.

Program Improvements Based on Assessment

Based on data collected this year, what changes are being considered or planned for the program?: No changes are anticipated during the 2020-21 academic year for Electrical Engineering or Computer Engineering.

During the previous year we continued refining the new Electric Circuits course, ECEN2714, and replaced PHYS3313 with a new course ECEN3903, Semiconductor Physics, that is being taught by ECE faculty members. A clinical faculty member became fully onboard to teach and manage the Capstone Design sequence, ECEN4013 and ECEN4024 with more consistency and rigor. Additional changes were made in course sequencing in the sophomore and junior years. A new course, ENSC2611, Electrical Fabrication Lab was added to provide experience in this important area. The CEAT Professional School concept was eliminated in ECE to support smoother progression of students through the curriculum.

As a result of feedback from our constituencies, discussion has begun regarding adding a degree option in Software Engineering.

Based on this year's findings, what (if any) changes are planned for the assessment process?: No changes are anticipated for the assessment process during the 2020-21 academic year, other than continued refinement and improvement of our assessment of student outcome #4 related to ethics and professionalism. Our assessment in this particular area is relatively young and developing, while the rest of the assessment process is well developed and implemented.

Describe the process for implementing these changes/planned program improvements: n/a

Program Improvements Made in the Last Year: Course Improvements, Curriculum Improvements, Assessment Measure Improvements

"Other" Improvements:

Goals for the Coming Year: Our next accreditation visit is scheduled during fall 2021. Our primary goals are to collect one more complete set of high quality data over the full set of student outcomes, and to complete additional refinement of the assessment and accompanying continuous improvement process where needed. Discussion will continue regarding a new option in Software Engineering.

Is this Summary Report Complete?: Yes

List all individuals associated with this report preparation: Keith A. Teague, Professor; Jeffrey L. Young, Professor and Head

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
ABET1: Identify, Formulate and Solve Problems - An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics **Outcome Status:** Active **Planned Assessment Year:** 2016 - 2017, 2017 - 2018, 2018 - 2019, 2019 - 2020, 2020 - 2021, 2021 - 2022, 2022 - 2023, 2023 - 2024 **Start Date:** **Archived Date:** **Outcome Type:** Skills **Reason for Archival:**	**Capstone Assignment -** Capstone Project Proposal (ECE) / Concept Design Review (interdisciplinary) *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester - fall and spring **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 2 - Meets Minimum Program Expectations (Developing) Student performance was assessed at 68% and 79%, averaging 74%, which exceeds the minimum expected threshold of 70%. Assessment was performed by the course instructor and faculty project advisors during the class project proposal / concept design review in week 3 of the semester. No action is required. (09/10/2019) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students enrolled in the ECE Capstone class, ECEN4024, and ECE students in the CEAT interdisciplinary design class participated. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** Performance marginally exceeds expectations. This outcome will be reassessed at the conclusion of the Capstone project in the interest of observing change/improvement over the course of the semester. Any action will be based on the end of semester assessment.	
	Capstone Assignment - Final Team Project Oral Presentation *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 4 - Exceeds Program Expectations (Advanced) Performance exceeds expectations. Student assessment measured 89.5% and 92% for the fall 2019 and spring 2020 semesters, respectively, averaging 91%. Evaluation was performed by the course instructor and faculty advisors during the final team project oral presentation. This is well above the expected performance threshold of 70%. This assessment was administered at the end of the course in comparison to the Capstone Project Proposal/Concept Design Review, which was administered at the beginning. A significant improvement is noted. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 as well as ECE students in the CEAT interdisciplinary capstone course were assessed. The	

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
		number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** Performance exceeds expectations. The outcome is met.	
	Capstone Assignment - Final Project Design Demonstration/Examination *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 4 - Exceeds Program Expectations (Advanced) The averages for fall 2019 and spring 2020 were 92.9% and 92.2%, respectively, with an average exceeding 92%. Assessment was performed by the course instructor and faculty advisors. The result easily meets the performance threshold of 70%. This assessment was administered during the final project design demonstration at the end of the course in comparison to the Capstone Project Proposal/Concept Design Review, which was administered at the beginning. A significant improvement is noted. Note: data for spring 2020 is drawn from the Capstone Final Oral Presentation assessment due to limitations imposed by COVID-19. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT interdisciplinary Capstone course were assessed. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** Outcome is met.	
	Analysis of Written Artifacts - Capstone Final Project Report *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**		
ABET2: Solutions to Meet Needs - An 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,	**Capstone Assignment -** Capstone Project Proposal (ECE) / Concept Design Review (interdisciplinary) *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams	**Reporting Period:** 2019 - 2020 **Conclusion:** 2 - Meets Minimum Program Expectations (Developing) The averages for fall 2019 and spring 2020 are 60.2% and 70.6%, respectively, with an average of 65.4% for this assessment performed at the beginning of the final senior	

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
and economic factors **Outcome Status:** Active **Planned Assessment Year:** 2018 - 2019, 2019 - 2020, 2020 - 2021, 2021 - 2022, 2022 - 2023, 2023 - 2024 **Start Date:** **Archived Date:** **Outcome Type:** Knowledge **Reason for Archival:**	**Timeline for Assessment:** **Other Assessment Type:**	semester. This assessment was performed by the course instructor and faculty advisors during the capstone project proposal / concept design review. This outcome will be assessed again at the conclusion of the course to determine change in performance. This result of this semester is marginally below the threshold of 70%, but the final assessment at the end of the semester will be used to determine performance. No action is required at this time. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT interdisciplinary Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** Results were typical for students assessed at the beginning of the Capstone course. Students will be reassessed at the conclusion of the Capstone course to determine if the outcome is met.	
	Capstone Assignment - Final Team Project Oral Presentation *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 4 - Exceeds Program Expectations (Advanced) The averages for fall 2019 and spring 2020 are 86.8% and 87.5%, respectively, with an average of 88.5% on this assessment performed by the course instructor and faculty advisors. The results are consistent and are significantly above the performance threshold of 70%. No action is required at this time. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** Performance was above expectations. The outcome was met. A comparison with the Capstone Design Proposal assessment performed at the	

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
		beginning of the course shows substantial improvement.	
	Capstone Assignment - Final Project Design Demonstration/Examination *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 4 - Exceeds Program Expectations (Advanced) The averages for fall 2019 and spring 2020 were 82.1% and 87.5%, respectively, with an average of 84.8% on this assessment performed by the course instructor and faculty advisors. The results easily surpass the minimum performance level of 70%. No action is required. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT Interdisciplinary Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The outcome is met. A comparison with the Capstone Design Proposal assessment performed at the beginning of the course shows substantial improvement.	
	Analysis of Written Artifacts - Capstone Final Project Report *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**		
ABET3: Effective Communication - An ability to communicate effectively with a range of audiences **Outcome Status:** Active **Planned Assessment Year:** 2016 - 2017, 2017 - 2018, 2018 - 2019, 2019 - 2020, 2020 - 2021, 2021 - 2022, 2022 - 2023, 2023 - 2024 **Start Date:** **Archived Date:** **Outcome Type:** Skills	**Capstone Assignment -** Capstone Project Proposal (ECE) / Concept Design Review (interdisciplinary) *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average over all students **Timeline for Assessment:** **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 2 - Meets Minimum Program Expectations (Developing) The averages for the fall 2019 and spring 2020 semesters are 73.9% and 77.9%, respectively, for an average of 75.9% on this assessment performed by the course instructor and faculty advisors at the beginning of the Capstone course. The results are similar to those from other semesters and exceed the minimum performance level of 70%. This outcome will be reassessed at the end of the course where a significant improvement is expected. No action is needed	

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
Reason for Archival:		at this time. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The assessment results are as expected. This outcome will be reassessed at the conclusion of the Capstone course.	
	Capstone Assignment - Final Team Project Oral Presentation *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 4 - Exceeds Program Expectations (Advanced) The averages for fall 2019 and spring 2020 are 89.5% and 87.5%, respectively, with an average of 88.5% on this assessment administered by the course instructor and faculty advisors. Comparing these results with the assessment performed at the beginning of the Capstone course shows a significant increase in student performance. The minimum performance level of 70% is easily met. No action is required. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The outcome is met.	
	Capstone Assignment - Final Project Design Demonstration/Examination *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**		
	Analysis of Written Artifacts - Capstone Final Project Report *** Learning Outcome**		

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
	Goal/Benchmark: Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**		
ABET4: Ethics and Professionalism - An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts **Outcome Status:** Active **Planned Assessment Year:** 2016 - 2017, 2017 - 2018, 2019 - 2020, 2020 - 2021, 2021 - 2022, 2022 - 2023, 2023 - 2024 **Start Date:** **Archived Date:** **Outcome Type:** Knowledge **Reason for Archival:**	**Project & Assignments -** Probability, Statistics and Ethics/Professionalism Assignment *** Learning Outcome** **Goal/Benchmark:** 70% minimum average over all students **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 2 - Meets Minimum Program Expectations (Developing) During fall 2019 students were asked to view three videos illustrating how statistics can be used to "lie", followed by a brief analysis of the case study "Trimming Data". This was the first use of this assessment and the results were reviewed but not graded. The activity will be further refined for future semesters. Performance was satisfactory. During the spring semester a problem was administered by the instructor dealing with "ethical use of statistics" related to medical testing, referenced to the current COVID-19 worldwide pandemic. Performance on this single case student was unsatisfactory, averaging 48.4%. This low result is likely due to two factors. First, the problem was not the same as examples in class requiring the students to stretch their knowledge, and second we are still developing experience in how to properly assess this outcome. More work is needed in this area. (09/09/2020) **Number of Students Assessed:** 64 **Number of Successful Students:** 64 **How were students selected to participate in the assessment of this outcome?:** Students in ECEN4503, Random Variables, participated in the activity. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The outcome is met marginally, but additional development of the assessment instruments is needed.	**Use of Findings (Actions):** Future performance will be tracked to determine if action is needed. (09/15/2020)
	Project & Assignments - Ethics activity in ECEN4013, Design of Engineering Systems *** Learning Outcome** **Goal/Benchmark:** 70% minimum average over all students	**Reporting Period:** 2019 - 2020 **Conclusion:** 2 - Meets Minimum Program Expectations (Developing) Approximately 28 students in ECEN4013, Design of Engineering Systems, completed a short ethics writing assignment during spring 2020. This represents a new	**Use of Findings (Actions):** Future performance will be tracked to determine if action is needed. (09/15/2020)

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
	Timeline for Assessment: Semester **Other Assessment Type:**	assessment in this class. The submitted papers were reviewed but they were not graded and the assessment did not become part of their final grade. The results were judged to be satisfactory and the assessment will be refined for use in future semesters. No additional action is required at this time. (09/15/2020) **Number of Students Assessed:** 28 **Number of Successful Students:** 28 **How were students selected to participate in the assessment of this outcome?:** Students in ECEN4013, Design of Engineering Systems, participated in the assessment activity. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The outcome was marginally met. Additional refinement of the assessment instrument is needed.	
ABET5: Teamwork - An 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 **Outcome Status:** Active **Planned Assessment Year:** 2016 - 2017, 2017 - 2018, 2018 - 2019, 2019 - 2020, 2020 - 2021, 2021 - 2022, 2022 - 2023, 2023 - 2024 **Start Date:** **Archived Date:** **Outcome Type:** Skills **Reason for Archival:**	**Capstone Assignment -** Capstone Project Proposal (ECE) / Concept Design Review (interdisciplinary) *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average over all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 2 - Meets Minimum Program Expectations (Developing) The average performance for fall 2019 and spring 2020 is 71.6% and 69.1%, respectively, for an average of 70.4% on this assessment performed by the Capstone course instructor and faculty advisors. Performance is typical for this assessment at the beginning of the Capstone course. This outcome is reassessed at the end of the Capstone course to judge final performance. No action is required at this time. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** Minimum performance is marginally met. This outcome will be reassessed at the conclusion of the Capstone course to judge final performance.	

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
	Other - CATME Team/Peer Evaluation Instrument *** Learning Outcome** **Goal/Benchmark:** Minimum overall average of 70% of the class achieving a score of 4.0/5.0 with a minimum number of students scoring below 3.0/5.0 **Timeline for Assessment:** Semester **Other Assessment Type:** Nationally developed and vetted evaluation instrument/survey		
	Capstone Assignment - Final Team Project Oral Presentation *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 4 - Exceeds Program Expectations (Advanced) Average performance for this assessment is 86.8% and 90.6%, respectively, with an average of 88.7% for this assessment performed by the Capstone course instructor and faculty advisors. This assessment is performed at the conclusion of the Capstone course and can be compared to the Capstone Project Proposal/Concept Design Review that is performed at the beginning of the course. As expected, performance at the end of the course is significantly improved, easily passing the 70% minimum level. No action is required. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The outcome is met easily.	
ABET6: Experiment, Analyze and Interpret Data - An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions **Outcome Status:** Active	**Capstone Assignment -** Final Team Project Oral Presentation *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 3 - Meets Program Expectations (Proficient) Average performance for the fall 2019 and spring 2020 semesters was 85.5% and 84.4%, respectively, for an average of 85%. This assessment was performed by the course instructor and the faculty advisors during the final team oral presentation at the conclusion of the Capstone	

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
Planned Assessment Year: 2016 - 2017, 2017 - 2018, 2018 - 2019, 2019 - 2020, 2020 - 2021, 2021 - 2022, 2022 - 2023, 2023 - 2024 **Start Date:** **Archived Date:** **Outcome Type:** Skills **Reason for Archival:**		course. Performance easily surpasses the minimum 70% threshold. No action is required. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The outcome is met.	
	Capstone Assignment - Final Project Design Demonstration/Examination *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 3 - Meets Program Expectations (Proficient) The average performance for the fall 2019 and spring 2020 semesters was 91.1% and 84.4%, respectively, for an average of 87.7%. Data for spring 2020 was combined from the Capstone Final Oral Presentation due to limitations imposed by COVID-19. This assessment was performed by the course instructor and faculty advisors during the final project design demonstration at the conclusion of the Capstone course. Overall performance easily surpasses the minimum threshold of 70%. No action is required. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The outcome is met.	
	Analysis of Written Artifacts - Capstone Final Project Report *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**		
ABET7: Acquisition of New	**Capstone Assignment -** Capstone	**Reporting Period:** 2019 - 2020	

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
Knowledge - An ability to acquire and apply new knowledge as needed, using appropriate learning strategies. **Outcome Status:** Active **Planned Assessment Year:** 2016 - 2017, 2017 - 2018, 2018 - 2019, 2019 - 2020, 2020 - 2021, 2021 - 2022, 2022 - 2023, 2023 - 2024 **Start Date:** **Archived Date:** **Outcome Type:** Knowledge **Reason for Archival:**	Project Proposal (ECE) / Concept Design Review (interdisciplinary) *** Learning Outcome** **Goal/Benchmark:** Minimum of 70% average over all students **Timeline for Assessment:** **Other Assessment Type:**	**Conclusion:** 2 - Meets Minimum Program Expectations (Developing) The averages for fall 2019 and spring 2020 were 67.5% and 80.0%, respectively, for an average of 73.8% on this assessment performed at the beginning of the Capstone course by the course instructor and faculty advisors during the capstone project proposal / concept design review. These results are typically near the minimum performance threshold of 70% for students assessed at the beginning of the Capstone course. A second assessment will be performed at the conclusion of the Capstone course. No action is needed at this time. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE Capstone course ECEN4024 and ECE students in the CEAT Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The relatively low results are normal for this assessment performed at the beginning of the Capstone semester. This outcome will be reassessed at the end of the Capstone project when a significant improvement is expected.	
	Capstone Assignment - Final Team Project Oral Presentation *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 4 - Exceeds Program Expectations (Advanced) The performance averages for fall 2019 and spring 2020 were 90.8% and 93.8%, respectively, for an average of 92.3%. This assessment was performed during the final team project oral presentation at the end of the Capstone course by the course instructor and faculty advisors and should be compared with the assessment performed at the beginning of the course, which is much lower as is expected. The result of this assessment easily surpasses the minimum performance level of 70%. No action is needed. (09/08/2020) **Number of Students Assessed:** 60 **Number of Successful Students:** 60 **How were students selected to participate in the assessment of this outcome?:** Students in the ECE	

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
		Capstone course ECEN4024 and ECE students in the CEAT Capstone course participated in the assessment. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The outcome is met.	
	Capstone Assignment - Final Project Design Demonstration/Examination *** Learning Outcome** **Goal/Benchmark:** Minimum 70% average across all student teams **Timeline for Assessment:** Semester **Other Assessment Type:**		
Program Criterion Prob and Stat - Probability and statistics with applications appropriate to the program name **Outcome Status:** Active **Planned Assessment Year:** 2018 - 2019, 2019 - 2020, 2020 - 2021, 2021 - 2022, 2022 - 2023, 2023 - 2024 **Start Date:** **Archived Date:** **Outcome Type:** Knowledge **Reason for Archival:**	**Course Exam(s) -** Evaluation of targeted final exam problems in ECEN4503 Random Signals *** Learning Outcome** **Goal/Benchmark:** At least 70% or better average over all students **Timeline for Assessment:** Annual **Other Assessment Type:**	**Reporting Period:** 2019 - 2020 **Conclusion:** 2 - Meets Minimum Program Expectations (Developing) Student performance during the fall 2019 and spring 2020 was assessed by the instructor in ECEN4503 through a selected problem on the final exam over a topic that all graduating ECE students are judged by the instructor to be able to complete. The results averaged 68.3% in the fall and 85.3% in the spring, with an overall average of 76.8%. It should be noted that the score on one problem was significantly lower than on the others. If the one low problem were omitted, performance would be approximately 83%. No action is needed at this time. (09/15/2020) **Number of Students Assessed:** 62 **Number of Successful Students:** 62 **How were students selected to participate in the assessment of this outcome?:** Students in ECEN4503, Random Variables, were administered the assessment during both fall and spring semesters. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The outcome was met, although the result on one problem was lower than expected. Additional monitoring is recommended.	**Use of Findings (Actions):** Future performance will be tracked to determine if action is needed. (09/15/2020)
Program Criterion Discrete Math - Discrete mathematics	**Course Exam(s) -** Evaluation of targeted final exam problems in	**Reporting Period:** 2019 - 2020 **Conclusion:** 3 - Meets Program Expectations (Proficient)	

Outcomes	Assessment Methods	Findings	Use of Findings (Actions)
Outcome Status: Active **Planned Assessment Year:** 2019 - 2020, 2020 - 2021, 2021 - 2022, 2022 - 2023, 2023 - 2024 **Start Date:** **Archived Date:** **Outcome Type:** Skills **Reason for Archival:**	CS3653 Discrete Mathematics *** Learning Outcome** **Goal/Benchmark:** At least 70% average over all ECE students **Timeline for Assessment:** Annual **Other Assessment Type:**	Two problems determined by the instructor of CS3653, Discrete Mathematics, to be representative of what an ECE student should know at the conclusion of the Discrete Mathematics class were administered during fall 2019. The average of the two problems was 80.3%, and the average score on each problem was 83.6% and 77%, respectively. 21 students (70%) scored at 70% or above, while 9 students scored below 70%. No action is needed at this time, but performance will be monitored in future semesters. (09/09/2020) **Number of Students Assessed:** 30 **Number of Successful Students:** 21 **How were students selected to participate in the assessment of this outcome?:** All ECE students enrolled in CS3653, Discrete Mathematics, during fall 2019 were assessed as part of the final examination. The number of students assessed is approximate. **What do the findings suggest about student achievement of this learning outcome?:** The outcome is met, although 30% of students scored an average of less than 70%. Performance will be monitored in future semesters.	