



Program Assessment Report (PAR)

Electrical & Computer Egr Tech (ECET) Baccalaureate Degree

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ACADEMIC YEAR COVERED BY THIS REPORT: 2021-2022

I. PROGRAM LEARNING OUTCOMES

The BSECET program began in 2018 and has had less than five graduates thus far. The program has yet to undergo a rigorous assessment. The current report is a summary of the planning as faculty continue to establish an ABET-quality continuous improvement process. The EE Undergraduate Studies Committee is planning for Spring 2023 to prepare a 6-year assessment plan that is consistent with the ABET Engineering Technology Accrediting Commission as described in the following sections. Hence, student learning outcomes are adopted from the Engineering Technology Accrediting Commission of ABET. The Learning Outcomes are revised by the (BSECET) program when ABET publishes updates. At the current time, the ABET outcomes are sufficient and satisfy the program's objectives. Faculty reviewed and voted to accept the following learning outcomes during the 2018-2019 academic year as recorded in the Department meeting minutes and are posted in the department webpages, the university catalog, and Electrical Engineering advising notes that are provided to department and university advising teams. The EE Undergraduate Studies committee is in the planning stage for data collection, but expects to follow the same process as the EE program to assess the outcomes on a yearly basis, maintain a record of the data, and meeting minutes that record faculty analysis and decisions for improving the program.

----- 1. an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline 2. an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline 3. an ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments; and an ability to identify and use appropriate technical literature 4. an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes 5. an ability to function effectively as a member as well as a leader on technical teams

II. PROCEDURES USED FOR ASSESSMENT

A. Direct Assessment

As part of the 6-year ABET review process, the BSECET program will follow a schedule to collect data and to assess each outcome. The schedule will be recorded electronically and available from the EE Department's shared folder OneDrive/UGS/ABET-Interim-2022-2028/abetData_ecet_2022-2028.xlsx. The program faculty are in the process of determining the specific courses and assessments but will include the core foundational courses and the program's capstone course. Some of the core sections will include non-BSECET students but only BSECET student works will be used in the assessment. For each learning outcome and assessment method listed by course in the table below, all works by BSECET students will be evaluated to determine the percentage of BSECET students who demonstrated satisfactory performance. Key questions from exams will be used for all Exam and Quiz-based assessments. Lab reports and lab performances will be evaluated for lab-based learning sections. Rubrics will be used to evaluate assignments in the capstone course (EE4910). The samples of student works will be collected during the year of a pending ABET review which will occur at least every 6 years. Examples of the how the Student Outcomes will be mapped to Specific Courses and Assessments -----

(1) an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline

----- EE4910

(1-25) Individual White Paper Identify and describe a design project to solve a realistic engineering problem

----- (2) an

ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline

----- EE 3310

(2-4) Prerequisite quiz circuit analysis (2-5) Exam/quiz problem Design and

analyze diode circuits such as rectifiers, clippers, etc. (2-6) Exam/quiz

problem Design and perform small-signal analysis of FET amplifiers (2-7)

Exam/quiz problem Design and perform small-signal analysis of BJT amplifiers

EE4910 (2-12) Design Specification Document Specify design to meet requirements

under multiple technical and non-technical constraints and incorporating design

standards (2-13) PDR System overview, design functionality (2-14) PDR Risks

(include safety, budget, schedule) (2-15) PDR HW design (2-16) PDR SW design

(2-17) Worksheet 3.7 Global Impact of Their SD Project (2-18) Worksheet 3.7

Economic Impact of Their SD Project (2-19) Worksheet 3.7 Environmental Impact of

Their SD Project (2-20) Worksheet 3.7 Societal Impact of Their SD Project (2-17)

Worksheet 3.7 Public Health Impact of Their SD Project (2-18) Worksheet 3.7

Public Safety Impact of Their SD Project (2-19) Worksheet 3.7 Public Welfare

Impact of Their SD Project (2-20) Worksheet 3.7 Cultural Impact of Their SD

Project -----

(5) an ability to function effectively as a member as well as a leader on technical teams

----- EE4910

(5-1) Teamwork (Marshmallow Challenge) Prepared for Assignment (5-2) Teamwork (Marshmallow Challenge) Assisted in Planning (5-3) Teamwork (Marshmallow Challenge) Completed Assigned Task (5-4) Teamwork (Marshmallow Challenge) Listens to Feedback

B. Scoring of Student Work

The program goal is for each assessment to have at least 70% of ECET students score a satisfactory or better score on the evaluated work. The results of data collection and analysis will be recorded in the data collection spreadsheet and in the program's internal self-improvement report which will both be located in the EE Department's shared folder \EE-UGS\ABET-self-study-report-2023-2028. Each learning outcome will be assessed as follows:

- Program faculty (full-time and part-time), and teaching assistants score the individual works (selected exam question, quiz question, lab skills demonstration, lab report, capstone course presentation, etc.).
- During the evaluation term, the instructor of record submits a list of the specific assessments along with the assignment, the number of students in the section, and the number of students who performed satisfactorily (typically 70% or better) on the assignment.
- The full-time Program faculty, by means of the EE Undergraduate Studies Committee, collects the data and calculates the percentage of students who performed satisfactorily.
- Each year, the EE Undergraduate Studies Committee analyzes the past-year's assessments and determines courses of action as needed.

C. Indirect Assessment

Each senior class completes an exit survey and meets with the Department Chair or the Chair's delegate to share their experiences and provide feedback on the BSECET Program. In addition, program faculty receive student feedback through the course evaluations, employer feedback from those students who complete an internship with industry, alumni, and the EE Department's External Advisory Board (EAB). Also, the Program Education Objectives which state what a BSECET graduate should be doing within a few years after graduation are evaluated with feedback from the agencies and companies who hire the WSU BSECET graduates, alumni, and the EAB.

III. ASSESSMENT RESULTS/INFORMATION:

The program has yet to collect data from the assessments and to analyze the results. The program faculty had expected to begin during Fall 2022 but the program is still small (less than 20 students entering in Fall 2022). Thus, the faculty expects to have the process in place to begin with the Fall 2023 term at which time it will assess the following Student Outcomes:

1. an ability to apply knowledge, techniques, skills and modern tools of mathematics, science,

engineering, and technology to solve well-defined engineering problems appropriate to the discipline 2. an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline 3. an ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments; and an ability to identify and use appropriate technical literature 4. an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes 5. an ability to function effectively as a member as well as a leader on technical team

There are no assessment results for 2018-2021. New program

The analysis will help the program know if students are on track to achieve the learning outcomes by the end of the program. The assessments from foundational core courses will allow faculty to determine if prerequisites, course sequence, course content and specific assessments should be revised during a cohort's program. Most importantly, the aggregate set of assessments will identify strengths and opportunities to improve the program and student outcomes.

IV. ACTIONS TO IMPROVE STUDENT LEARNING

A complete discussion of actions taken by faculty will be available as a self-study report with emphasis on continuous improvement, and will be located on the EE Department's shared drive \EE-UGS\ABET-self-study-report-2023-2028. Results will be shared with EE faculty as a whole at Department meetings or by electronic communication from the Undergraduate Studies Committee. Individual faculty who direct courses such as the capstone course will make regular adjustments based on the information. Some changes as shown in the self-study report will include redefined assessments and instruments, changes in course content and materials, and policies. When assessment results are strong during one semester but fall short during the second semester faculty will typically wait for the next assessment cycle to reevaluate and determine if action is warranted.

V. SUPPORTING DOCUMENTS

Additional documentation, when provided, is stored in the internal Academic Program Assessment of Student Learning SharePoint site.