

Academic Program Assessment Plan for the Bachelors in Biomedical Engineering Program

1. Student Learning Outcomes:

- (1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- (2) 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, and economic factors
- (3) An ability to communicate effectively with a range of audiences
- (4) 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
- (5) 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
- (6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- (7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The above listed student learning outcomes are stipulated by ABET. ABET is the Accreditation Board of Engineering and Technology that accredits all engineering programs in the USA and many other countries.

2. Explanation of Methods

The following chart lists the methods used, as well as a description of each method, the timeline or implementation, the person responsible, and the objectives each method addresses. All outcomes are assessed by at least one direct method.

Table 1: Assessment Chart

Method	Direct/indirect	Description/Target	Timeline	Person responsible	Objectives addressed
Course Assessment Surveys	Indirect	<p>Students in every course are surveyed to assess their opinion about meeting the stated outcomes.</p> <p>Target: Average score for each outcome should be higher than or equal 3.5 out of a maximum of 5</p>	Every semester, every year	Department chair and assessment committee are responsible for the assessment activities. A teaching assistant administers the survey and another graduate student tabulates the data. The chair and the assessment committee analyze the data	1 through 7
Embedded questions in HW assignments and examinations	Direct	<p>Embedded questions are placed in HW assignments and exams to assess each outcome covered by the course.</p> <p>Target: The aggregate for each outcome should be equal or higher than 70%</p>	Every semester, every year	Department chair and assessment committee are responsible for the assessment activities. A teaching assistant administers the survey and another graduate student tabulates the data. The chair and the assessment committee analyze the data	1 through 7
External reviewers of the capstone design course	Direct	<p>A group of experts in Electrical Engineering comes during the senior design day to evaluate the projects of the senior design course. They evaluate the projects with respect to the learning outcomes. They give a numerical score for meeting each outcome. These data are aggregated and analyzed to determine the final scores for the course.</p> <p>Target: Aggregate score for each outcome should be equal or higher than 70%.</p>	Every Spring semester of each year	Department chair, senior design instructor, and assessment committee are responsible for the assessment activities. The Chair of the assessment committee tabulates the data and conducts the analysis.	1 through 7

Outcomes-by Methods

Table 2: Outcomes addressed by methods

Learning Outcome	Course assessment surveys	Embedded HW assignments and examinations	External reviews on the Capstone design course
(1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	X	X	X
(2) 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, and economic factors	X	X	X
(3) An ability to communicate effectively with a range of audiences	X	X	X
(4) 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	X	X	X
(5) 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	X	X	X
(6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use	X	X	X

engineering judgment to draw conclusions			
(7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	X	X	X