BS Electrical Engineering 2021-2022

Completed

1 GOALS 5 OUTCOMES 5 MEASURES 5 TARGETS 5 FINDINGS 1 ATTACHMENTS

Institutional Mission

Lamar University is dedicated to student success by engaging and empowering students with the skills and knowledge to thrive in their personal lives and chosen fields of endeavor. As a doctoral granting institution, Lamar University is internationally recognized for its high quality academics, innovative curriculum, diverse student population, accessibility, student success, and leading-edge scholarly activities contributing to transforming the communities of Southeast Texas and beyond.

Program Mission

The Department of Electrical Engineering supports the mission of the College of Engineering and Lamar University through teaching, research and service designed to provide the very best undergraduate electrical engineering education possible. It is our goal to provide our students with a strong theoretical foundation, practical engineering skills, experience in interpersonal communication and teamwork, and a daily emphasis on ethics, professional conduct and critical thinking. We prepare our graduates for successful engagement in their choice of commercial or industrial enterprise, research and development, or graduate study. We emphasize and support the training necessary for practice as professional engineers.

1 Program Goals

The Department of Electrical Engineering supports the mission of the College of Engineering and Lamar University through teaching, research and service designed to provide the very best undergraduate electrical engineering education possible. It is our goal to provide our students with a strong theoretical foundation, practical engineering skills, experience in interpersonal communication and teamwork, and a daily emphasis on ethics, professional conduct and critical thinking. We prepare our graduates for successful engagement in their choice of commercial or industrial enterprise, research and development, or graduate study. We emphasize and support the training necessary for practice as professional engineers.

1.1 Student Learning Outcomes

An ability to identify, formulate, and solve engineering problems

The ELEN4306 Senior Project Design I and ELEN4307 Senior Project Design II courses were selected for the assessment of the outcomes of the undergraduate program since they are required capstone course sequence and incorporate elements that span the entire curriculum at an advanced level. The following three rubric dimensions are used to evaluate this outcome: - Objectives and description identify problem aimed to be solved by project, - Design formulates problem by applying science, math and engineering, - Technical approach applies

principles of science, math and engineering. Details may be found in the assessment plan posted on the LU SACS web page.

Supported Initiatives (8)

GENERAL EDUCATION

- Critical Thinking Skills - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- Teamwork - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

INSTITUTIONAL PRIORITIES

- Acquiring, constructing, integrating, and applying knowledge
- Critical Thinking
- Problem Solving
- Decision Making
- Teamwork

STRATEGIC INITIATIVES

- SP - 2 - Leverage our core strengths while elevating the overall quality of our education and scholarship.

1.1.1 **Measures**

Exit Project Evaluations

Source of evidence: Team projects

METHODOLOGY*

Project teams make presentations to some of the faculty members/instructors in the Fall and Spring semesters to present the progress on their projects until that time. Each team member presents part of the team's project, so all the members of a team are required to be involved in presentations. Team members are required to answer questions from the evaluators and other students on their projects. Three dimensions are used in assessment: 1) presentation skills, 2) presentation document, 3) project. In addition, all faculty members evaluate senior design projects at the end of each academic year based on a set of rubrics designed to yield quantitative measures of student and team performances against individual outcomes. The rubrics were approved by the faculty members when they were developed. Each faculty member evaluates the projects and team performances based on the rubrics. The following three rubric dimensions are used in assessment: - Objectives and description identify problem aimed to be solved by project, - Design formulates problem by applying science, math and engineering, - Technical approach applies principles of science, math and engineering. Scores are given based on the following metrics: 4) Exceeds expectations, 3) Meets expectations, 2)

Below expectations, 1) Does not meet expectations.

SOURCE OF EVIDENCE

Project - Academic Direct

1.1.1.1 Achievement Target

2021-2022 Met

ACHIEVEMENT TARGET	To obtain the desired level of performance for this outcome, at least 75% of the projects must have all rubric dimensions scored at least 3 (meets expectations) or 4 (exceeds expectations).
FINDINGS	All senior design projects that were done by teams of four students obtained scores that were above 3 (meets expectations). The average score was over 89%.
ANALYSIS OF FINDINGS	Eight faculty members evaluated seven senior design projects; three Full Professors, three Associate Professors and two Instructors. The Instructor of the Senior Design courses did not participate in scoring. The projects scored an average of 10.75 out of 12 for this outcome, giving an average of over 89%. All the projects obtained scores above 3 (meets expectations).
IMPROVEMENT TYPE	Academic
IMPROVEMENT DESCRIPTION	No Improvements Deemed Necessary
IMPROVEMENT	

1.2 Student Learning Outcomes

An ability to apply engineering design to produce solutions

The ELEN4306 Senior Project Design I and ELEN4307 Senior Project Design II courses were selected for the assessment of the outcomes of the undergraduate program since they are required capstone course sequence and incorporate elements that span the entire curriculum at an advanced level. The following rubric dimension is used to evaluate this outcome: - Engineering design is applied to provide solutions that meet desired needs. Details may be found in the assessment plan posted on the LU SACS web page.

Supported Initiatives (11)

GENERAL EDUCATION

- Critical Thinking Skills - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- Teamwork - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal
- Social Responsibility - to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities
- Personal Responsibility - to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

INSTITUTIONAL PRIORITIES

- Acquiring, constructing, integrating, and applying knowledge
- Critical Thinking
- Problem Solving
- Teamwork
- Global and Cultural Perspective/Appreciation
- Social and Civic Responsibility

STRATEGIC INITIATIVES

- SP - 2 - Leverage our core strengths while elevating the overall quality of our education and scholarship.

1.2.1 **Measures**

Exit Project Evaluations

Source of evidence: Team projects

METHODOLOGY*

Project teams make presentations to some of the faculty members/instructors in the Fall and Spring semesters to present the progress on their projects until that time. Each team member presents part of the team's project, so all the members of a team are required to be involved in presentations. Team members are required to answer questions from the evaluators and other students on their projects. Three dimensions are used in assessment: 1) presentation skills, 2) presentation document, 3) project. In addition, all faculty members evaluate senior design projects at the end of each academic year based on a set of rubrics designed to yield quantitative measures of student and team performances against individual outcomes. The rubrics were approved by the faculty members when they were developed. Each faculty member evaluates the projects and team performances based on the rubrics. The following rubric dimension is used in assessment: - Engineering design is applied to provide solutions that meet desired needs. Scores are given based on the following metrics: 4) Exceeds expectations,

3) Meets expectations, 2) Below expectations, 1) Does not meet expectations.

SOURCE OF EVIDENCE

Project - Academic Direct

1.2.1.1 Achievement Target

2021-2022 Met

ACHIEVEMENT TARGET	To obtain the desired level of performance for this outcome, at least 75% of the projects must have all rubric dimensions scored at least 3 (meets expectations) or 4 (exceeds expectations).
FINDINGS	All senior design projects that were done by teams of four students obtained scores that were above 3 (meets expectations). The average score was over 88%.
ANALYSIS OF FINDINGS	Eight faculty members evaluated seven senior design projects; three Full Professors, three Associate Professors and two Instructors. The Instructor of the Senior Design courses did not participate in scoring. The projects scored an average of 3.54 out of 4 for this outcome, giving an average of over 88%. All the projects obtained scores above 3 (meets expectations).
IMPROVEMENT TYPE	Academic
IMPROVEMENT DESCRIPTION	No Improvements Deemed Necessary
IMPROVEMENT	

1.3 Student Learning Outcomes

An ability to function effectively on a team

The ELEN4306 Senior Project Design I and ELEN4307 Senior Project Design II courses were selected for the assessment of the outcomes of the undergraduate program since they are required capstone course sequence and incorporate elements that span the entire curriculum at an advanced level. The following rubric dimension is used to evaluate this outcome: - Tasks are effectively proposed and executed to meet project objectives. Details may be found in the assessment plan posted on the LU SACS web page.

Supported Initiatives (9)

GENERAL EDUCATION

- Critical Thinking Skills - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- Teamwork - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

INSTITUTIONAL PRIORITIES

- Acquiring, constructing, integrating, and applying knowledge
- Critical Thinking
- Problem Solving
- Decision Making
- Time Management/Prioritization
- Planning

STRATEGIC INITIATIVES

- SP - 2 - Leverage our core strengths while elevating the overall quality of our education and scholarship.

1.3.1 **Measures**

Exit Project Evaluations

Source of evidence: Team projects

METHODOLOGY*

Project teams make presentations to some of the faculty members/instructors in the Fall and Spring semesters to present the progress on their projects until that time. Each team member presents part of the team's project, so all the members of a team are required to be involved in presentations. Team members are required to answer questions from the evaluators and other students on their projects. Three dimensions are used in assessment: 1) presentation skills, 2) presentation document, 3) project. In addition, all faculty members evaluate senior design projects at the end of each academic year based on a set of rubrics designed to yield quantitative measures of student and team performances against individual outcomes. The rubrics were approved by the faculty members when they were developed. Each faculty member evaluates the projects and team performances based on the rubrics. The following rubric dimension is used in assessment: - Tasks are effectively proposed and executed to meet project objectives. Scores are given based on the following metrics: 4) Exceeds expectations, 3) Meets expectations, 2) Below expectations, 1) Does not meet expectations.

SOURCE OF EVIDENCE

Project - Academic Direct

1.3.1.1 Achievement Target

2021-2022 Met

ACHIEVEMENT TARGET	To obtain the desired level of performance for this outcome, at least 75% of the projects must have all rubric dimensions scored at least 3 (meets expectations) or 4 (exceeds expectations).
FINDINGS	All senior design projects that were done by teams of four students obtained scores that were above 3 (meets expectations). The average score was over 84%.
ANALYSIS OF FINDINGS	Eight faculty members evaluated seven senior design projects; three Full Professors, three Associate Professors and two Instructors. The Instructor of the Senior Design courses did not participate in scoring. The projects scored an average of 3.39 out of 4 for this outcome, giving an average of over 84%. All the projects obtained scores above 3 (meets expectations).
IMPROVEMENT TYPE	Academic
IMPROVEMENT DESCRIPTION	No Improvements Deemed Necessary
IMPROVEMENT	

1.4 Student Learning Outcomes

An ability to develop and conduct appropriate experimentation

The ELEN4306 Senior Project Design I and ELEN4307 Senior Project Design II courses were selected for the assessment of the outcomes of the undergraduate program since they are required capstone course sequence and incorporate elements that span the entire curriculum at an advanced level. The following two rubric dimensions are used to evaluate this outcome: - Project hardware/software demonstration is performed properly, - Discussions and conclusions reflect efficient application of engineering judgment. Details may be found in the assessment plan posted on the LU SACS web page.

Supported Initiatives (5)

GENERAL EDUCATION

- Critical Thinking Skills - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- Teamwork - to include the ability to consider different points of view and to work

effectively with others to support a shared purpose or goal

INSTITUTIONAL PRIORITIES

- Critical Thinking
- Teamwork

STRATEGIC INITIATIVES

- SP - 2 - Leverage our core strengths while elevating the overall quality of our education and scholarship.

1.4.1 **Measures**

Exit Project Evaluations

Source of evidence: Team projects

METHODOLOGY*

Project teams make presentations to some of the faculty members/instructors in the Fall and Spring semesters to present the progress on their projects until that time. Each team member presents part of the team's project, so all the members of a team are required to be involved in presentations. Team members are required to answer questions from the evaluators and other students on their projects. Three dimensions are used in assessment: 1) presentation skills, 2) presentation document, 3) project. In addition, all faculty members evaluate senior design projects at the end of each academic year based on a set of rubrics designed to yield quantitative measures of student and team performances against individual outcomes. The rubrics were approved by the faculty members when they were developed. Each faculty member evaluates the projects and team performances based on the rubrics. The following two rubric dimensions are used in assessment: - Project hardware/software demonstration is performed properly, - Discussions and conclusions reflect efficient application of engineering judgment. Scores are given based on the following metrics: 4) Exceeds expectations, 3) Meets expectations, 2) Below expectations, 1) Does not meet expectations.

SOURCE OF EVIDENCE

Project - Academic Direct

1.4.1.1 **Achievement Target**

2021-2022 Met

ACHIEVEMENT TARGET: To obtain the desired level of performance for this outcome, at least 75% of the projects must have all rubric dimensions scored at least 3 (meets expectations) or 4 (exceeds expectations).

FINDINGS: All senior design projects that were done by teams of four students obtained scores

that were above 3 (meets expectations). The average score was over 86%.

ANALYSIS OF FINDINGS

Eight faculty members evaluated seven senior design projects; three Full Professors, three Associate Professors and two Instructors. The Instructor of the Senior Design courses did not participate in scoring. The projects scored an average of 6.91 out of 8 for this outcome, giving an average of over 86%. All the projects obtained scores above 3 (meets expectations).

IMPROVEMENT TYPE

Academic

IMPROVEMENT DESCRIPTION

No Improvements Deemed Necessary

IMPROVEMENT

1.5 Student Learning Outcomes

An ability to acquire and apply new knowledge

The ELEN4306 Senior Project Design I and ELEN4307 Senior Project Design II courses were selected for the assessment of the outcomes of the undergraduate program since they are required capstone course sequence and incorporate elements that span the entire curriculum at an advanced level. The following rubric dimension is used to evaluate this outcome: - Ability to learn and apply new knowledge has been developed. Details may be found in the assessment plan posted on the LU SACS web page.

Supported Initiatives (6)

GENERAL EDUCATION

- Critical Thinking Skills - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- Teamwork - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

INSTITUTIONAL PRIORITIES

- Acquiring, constructing, integrating, and applying knowledge
- Critical Thinking
- Teamwork

STRATEGIC INITIATIVES

- SP - 2 - Leverage our core strengths while elevating the overall quality of our education and scholarship.

1.5.1 Measures

Exit Project Evaluations

Source of evidence: Team projects

METHODOLOGY*

Project teams make presentations to some of the faculty members/instructors in the Fall and Spring semesters to present the progress on their projects until that time. Each team member presents part of the team's project, so all the members of a team are required to be involved in presentations. Team members are required to answer questions from the evaluators and other students on their projects. Three dimensions are used in assessment: 1) presentation skills, 2) presentation document, 3) project. In addition, all faculty members evaluate senior design projects at the end of each academic year based on a set of rubrics designed to yield quantitative measures of student and team performances against individual outcomes. The rubrics were approved by the faculty members when they were developed. Each faculty member evaluates the projects and team performances based on the rubrics. The following rubric dimension is used in assessment: - Ability to learn and apply new knowledge has been developed. Scores are given based on the following metrics: 4) Exceeds expectations, 3) Meets expectations, 2) Below expectations, 1) Does not meet expectations.

SOURCE OF EVIDENCE

Project - Academic Direct

1.5.1.1 Achievement Target

2021-2022 Met

ACHIEVEMENT TARGET	To obtain the desired level of performance for this outcome, at least 75% of the projects must have all rubric dimensions scored at least 3 (meets expectations) or 4 (exceeds expectations).
FINDINGS	All senior design projects that were done by teams of four students obtained scores that were above 3 (meets expectations). The average score was over 88%.
ANALYSIS OF FINDINGS	Eight faculty members evaluated seven senior design projects; three Full Professors, three Associate Professors and two Instructors. The Instructor of the Senior Design courses did not participate in scoring. The projects scored an average of 3.52 out of 4 for this outcome, giving an average of over 88%. All the projects obtained scores above 3 (meets expectations).
IMPROVEMENT TYPE	Academic

IMPROVEMENT DESCRIPTION	No Improvements Deemed Necessary
IMPROVEMENT	

Project Attachments (1)

Attachments	File Size
Senior_Design_Rubric_ABET_Outcomes_1-7.pdf	59KB