Mechanical Engineering [MEEG]

Cycles included in this report:
Jun 1, 2022 to May 31, 2023

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Program Name: Mechanical Engineering [MEEG]

Reporting Cycle: Jun 1, 2022 to May 31, 2023

1 Is this program offered via Distance Learning?

100% Traditional or less than 50% Distance/Traditional

2 Is this program offered at an off-site location?

No

2.1 If yes to previous, provide addresses for each location where 50% or more of program credits may be earned.

3 Example of Program Improvement

2021-2022:

2022-2023:

- Recruited a new faculty member with Doctorate in Mechanical Engineering.
- Created Advanced Fluid Mechanics MEEN 411 course.
- Purchased new lab equipment - ETL 109 Engineering measurements and Strength of material lab.
- Enhanced the Wind Tunnel equipment and created ASME student project lab in ETL 121.

4 Program Highlights from the Reporting Year

2021-2022:
We obtained external funding of $88,050 and internal funding of $60,000 for research and equipment. We also published two journal papers, one book chapter, and five conference papers. Dr. Zhuang Li won the President's Award for Excellence from McNeese State University in August 2021.

2022-2023:

- Two students presented at 2023 LSU Discover Day and one of them got second place in poster competition.
- Three students presented at 2023 University of Louisiana System Academic Summit.
- ASME students participated in LaACES Balloon project.
- One undergraduate Senior Design research project resulted in a publication in 2022 ASME Annual International Conference.
- Two undergraduate senior design projects resulted in two publications in 2023 ASME Annual International Conference.
- Faculty secured external funding of $32,000 for undergraduate research projects.
- Faculty secured internal funding of $25,000 for upgrading the computers for ETL 109 and ETL 121 laboratories.
- Faculty secured internal funding of $10K for undergraduate research projects.
- Mechanical Engineering students have revitalized dormant Society of Automotive Engineers Chapter.
- For E-week, mechanical engineering students showcased lab demonstrations to approx 300 local high school students.
- During E-week, industry experts from mechanical engineering background gave presentations to current mechanical engineering students.
- One undergraduate student presented a research paper in 2022 ASME Fluids Engineering Summer Conference.

5 Program Mission

The Department of Engineering and Computer Science provides a professionally focused education in the fields of computer science and engineering. Students are prepared to practice in their chosen field and to focus on the industrial and business needs of the region. Students have opportunities for close interaction with faculty, business, and the industrial community in a practice-oriented, student-friendly environment. The department maintains Accreditation Board for Engineering and Technology (ABET)-accredited curricula that foster interdisciplinary teamwork as well as scholarly development through special projects, internships, discussions of professional ethics, and training with regional business or industries. Students are prepared to study for advanced degrees and/or work in regional business or industries upon graduation.

6 Institutional Mission Reference

The program mission supports the University mission by fostering student success, academic excellence, and University-community alliances. In the program mission, student success and academic excellence are promoted by a professionally focused and practice-oriented student friendly environment, and by maintaining an up-to-date curriculum. The University mission is also accomplished by the close cooperation with regional industry.

7 Assessment and Benchmark MEEN 321 Coursework [Approved]

Assessment: Students' work (tests, homework, quizzes, or projects) taken from MEEN 321. ABET 3.1 rubric is used to evaluate SLOs.

Benchmark: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. An average score of 3.30/5.00 is the desired achievement level.

Outcome Links

3.1-PC1 [Program]
Apply mathematics to obtain analytical or numerical solutions to engineering equations or models.

3.1-PC2 [Program]
Identify the engineering principles that govern operations of components or systems/processes.

3.1-PC3 [Program]
Apply the scientific/engineering principles that govern operations of components or systems/processes.

ABET EAC [External]

3.1

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

7.1 Data

Academic Year	Average score on PC1
2021-2022	3.88/5.00
2022-2023	3.35/5.00

Outcome Links

3.1-PC1 [Program]
Apply mathematics to obtain analytical or numerical solutions to engineering equations or models.

ABET EAC [External]

3.1

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

7.1.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year.

7.2 Data

Academic Year	Average score on PC2
2021-2022	3.60/5.00
2022-2023	2.77/5.00

Outcome Links

3.1-PC2 [Program]
Identify the engineering principles that govern operations of components or systems/processes.

ABET EAC [External]

3.1

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

7.2.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was not met for the 2022-23 academic year. Students in recent years lack basic skills in arithmetic, algebra, and trigonometry. Although the instructor spent a whole class to go through these basic skills, some of the students could not solve simple equations. It is why Quiz #4's score is quite low. In the final exam, a similar question was given, but 1/3 of the class had 0. Students need better elementary and secondary education.

7.3 Data

Academic Year	Average score on PC3
2021-2022	3.88/5.00
2022-2023	3.87/5.00

Outcome Links

3.1-PC3 [Program]
Apply the scientific/engineering principles that govern operations of components or systems/processes.

ABET EAC [External]

3.1

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

7.3.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year. The score sustained from the 2021-2022 academic year.

8 Assessment and Benchmark MEEN 409 Coursework [Approved]

Assessment: Students work (tests, homework, quizzes, or projects) taken from MEEN 409. ABET 3.1 rubric is used to evaluate SLOs.

Benchmark for PC1: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. An average score of 3.50/5.00 is the desired achievement level.

Benchmark for PC2: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. An average score of 3.30/5.00 is the desired achievement level.

Outcome Links

3.1-PC4 [Program]
Recognize nature of and determine steps to the solution of engineering problems.

3.1-PC5 [Program]
Solve engineering problems requiring the use of "external" tables, charts, data, or models.

ABET EAC [External]

3.1

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

8.1 Data

Academic Year	Average score on PC4
2021-2022	2.70/5.00
2022-2023	3.68/5.00

Outcome Links

3.1-PC4 [Program]
Recognize nature of and determine steps to the solution of engineering problems.

ABET EAC [External]

3.1

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

8.1.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
Too many confounding variables, such as the first semester back after COVID, online delivery, hurricane recovery, and a new instructor for course.

2022-2023:
The benchmark was met for the 2022-23 academic year. The average score significantly improved from the 2021-2022 academic year.

8.2 Data

Academic Year	Average score on PC5
2021-2022	2.50/5.00
2022-2023	4.45/5.00

Outcome Links

3.1-PC5 [Program]
Solve engineering problems requiring the use of "external" tables, charts, data, or models.

ABET EAC [External]

3.1

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

8.2.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was not met for the 2021-22 academic year. More data needs to be collected before making a change to the benchmark.

2022-2023:
The benchmark was met for the 2022-23 academic year. The average score significantly improved from the 2021-2022 academic year.

9 Assessment and Benchmark MEEN 316 Coursework [Approved]

Assessment: Students' work taken from MEEN 316. ABET 3.3 (W) rubric is used to evaluate SLOs.

Benchmark: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. An average score of 3.50/5.00 is the desired achievement level.

Outcome Links

3.3 (W)-PC1 [Program]
Demonstrate proper English composition, grammar, and spelling.

3.3 (W)-PC2 [Program]
Demonstrate logical organization and document formatting.

3.3 (W)-PC3 [Program]
Demonstrate originality of content as well as effective integration of secondary courses.

ABET EAC [External]

3.3

An ability to communicate effectively with a range of audiences.

9.1 Data

Academic Year	Average score on PC1
2021-2022	3.52/5.00
2022-2023	4.84/5.00

Outcome Links

3.3 (W)-PC1 [Program]
Demonstrate proper English composition, grammar, and spelling.

ABET EAC [External]

3.3

An ability to communicate effectively with a range of audiences.

9.1.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year. The average score significantly improved from the 2021-2022 academic year.

9.2 Data

Academic Year	Average score on PC2
2021-2022	3.38/5.00
2022-2023	4.16/5.00

Outcome Links

3.3 (W)-PC2 [Program]
Demonstrate logical organization and document formatting.

ABET EAC [External]

3.3

An ability to communicate effectively with a range of audiences.

9.2.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was not met for academic year 2021-22. More data needs to be collected before changing the benchmark.

2022-2023:
The benchmark was met for the 2022-23 academic year. The average score significantly improved from the 2021-2022 academic year.

9.3 Data

Academic Year	Average score on PC3
2021-2022	3.57/5.00
2022-2023	4.97/5.00

Outcome Links

3.3 (W)-PC3 [Program]
Demonstrate originality of content as well as effective integration of secondary courses.

ABET EAC [External]

3.3

An ability to communicate effectively with a range of audiences.

9.3.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year. The average score significantly improved from the 2021-2022 academic year.

10 Assessment and Benchmark ENGR 491 Project and Team Survey [Approved]

Assessment: Students work (Project and Team Survey) taken from ENGR 491. ABET 3.5 rubric is used to evaluate SLOs.

Benchmark for PC1: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. An average score of 3.50/5.00 is the desired achievement level.

Benchmark for PC2: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. An average score of 4.00/5.00 is the desired achievement level.

Benchmark for PC3: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. An average score of 3.50/5.00 is the desired achievement level.

Outcome Links

3.5-PC1 [Program]
Contribute to team objectives through active participation in team activities.

3.5-PC2 [Program]
Contribute to team objectives through performance of individual assigned tasks to achieve goals and objectives.

3.5-PC3 [Program]
Contribute to team objectives through productive interdisciplinary activities.

ABET EAC [External]

3.5

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.

10.1 Data

Academic Year	Average score on PC1
2021-2022	4.47/5.00
2022-2023	4.48/5.00

Outcome Links

3.5-PC1 [Program]
Contribute to team objectives through active participation in team activities.

ABET EAC [External]

3.5

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.

10.1.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year. The score sustained from the 2021-2022 academic year.

10.2 Data

Academic Year	Average score on PC2
2021-2022	4.64/5.00
2022-2023	4.61/5.00

Outcome Links

3.5-PC2 [Program]
Contribute to team objectives through performance of individual assigned tasks to achieve goals and objectives.

ABET EAC [External]

3.5

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.

10.2.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year. The score sustained from the 2021-2022 academic year.

10.3 Data

Academic Year	Average score on PC3
2021-2022	4.65/5.00
2022-2023	4.60/5.00

Outcome Links

3.5-PC3 [Program]
Contribute to team objectives through productive interdisciplinary activities.

ABET EAC [External]

3.5

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.

10.3.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year. The score sustained from the 2021-2022 academic year.

11 Assessment and Benchmark MEEN 415 Coursework [Approved]

Assessment: Students work (tests, homework, quizzes, or projects) taken from MEEN 415. ABET 3.6 rubric is used to evaluate SLOs.

Benchmark: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. An average score of 3.30/5.00 is the desired achievement level.

Outcome Links

3.6-PC1 [Program]
Demonstrate knowledge of safety considerations and run the experiment in a safe and appropriate manner.

3.6-PC2 [Program]
Apply measurement techniques to the experiment.

3.6-PC3 [Program]
Analyze the data using the experimental and engineering tools and/or methods.

3.6-PC4 [Program]
Use engineering judgement to draw conclusions on how results relate to or are different from theory, appropriate models, or previous results.

ABET EAC [External]

3.6

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

11.1 Data

Academic Year	Average score on PC1
2021-2022	3.67/5.00
2022-2023	4.29/5.00

Outcome Links

3.6-PC1 [Program]
Demonstrate knowledge of safety considerations and run the experiment in a safe and appropriate manner.

ABET EAC [External]

3.6

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

11.1.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year. The score is improved from the 2021-2022 academic year.

11.2 Data

Academic Year	Average score on PC2
2021-2022	4.33/5.00
2022-2023	3.87/5.00

Outcome Links

3.6-PC2 [Program]
Apply measurement techniques to the experiment.

ABET EAC [External]

3.6

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

11.2.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year. The score is declined slightly from the 2021-2022 academic year.

11.3 Data

Academic Year	Average score on PC3
2021-2022	3.76/5.00
2022-2023	3.84/5.00

Outcome Links

3.6-PC3 [Program]
Analyze the data using the experimental and engineering tools and/or methods.

ABET EAC [External]

3.6

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

11.3.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year. The score is improved from the 2021-2022 academic year.

11.4 Data

Academic Year	Average score on PC4
2021-2022	4.10/5.00
2022-2023	3.87/5.00

Outcome Links

3.6-PC4 [Program]
Use engineering judgement to draw conclusions on how results relate to or are different from theory, appropriate models, or previous results.

ABET EAC [External]

3.6

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

11.4.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met for the 2021-22 academic year. More data needs to be gathered before making a continuous improvement plan.

2022-2023:
The benchmark was met for the 2022-23 academic year. The score is declined slightly from the 2021-2022 academic year.

End of report