Chemical Engineering [CHEG]

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

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Program Name: Chemical Engineering [CHEG]

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:
This doesn't apply for the 21-22 academic year, because it's a new program. The department will monitor the assessments over the next few years to see examples of program improvement.

2022-2023:

- Hired a new Chemical Engineering Faculty.
- CHEN 210 - Intense implementation of numerical methods and excel
- CHEN 314 - Advanced design of distillation column with hydraulics and costing
- CHEN 413 - Introduction of absorption design in Aspen
- CHEN 447 - Introduced Aspen plus simulation sequence (skeleton, shortcut, rigorous design)
- ENGR 315 - Detailed design of Heat Exchanger including zone analysis, network and costing.
- CHEN 403 and 407 - Introduction to Heat Exchanger Network Design using Aspen HYSYS, Cost analysis through Aspen Cost Analyzer
- Maintenance and Repair of major equipment in HOT unit was carried out.
- Upgraded the electrical inline heater for heat exchanger module
- Build the fixed bed reactor to perform gas phase catalysis reactions in ETL 105
- Installed a Gas Chromatograph for liquid analysis in ETL 105
- Procured a kit to fix Chemsorption unit and will be installed during Summer 2023.
- Procured Thermogravimetric-DSC analyzer and installation will be completed in Summer 2023.
- CHEN 552/ENGR 360 - Added LNG plant visit as a criteria to the class.

4 Program Highlights from the Reporting Year

2021-2022:
A team of 7-10 chemical engineering students worked on the ChemE car (a chemical engineering car, that runs off a chemical reaction). The students placed first in the safety category and qualified for the national ChemE car competition.

2022-2023:

- Chemical Engineering students participated in 2022 AIChE Annual conference and secured 7th place in Chem E Car competition.
- Chemical Engineering students participated in 2023 Southwest Regional AIChE Conference and secured 1st place in Chem E Car competition and qualified for 2023 Annual conference.
- Chemical Engineering students won the bid to host 2024 Southwest Regional AIChE Conference at McNeese (in April 2024)
- Senior Chemical Engineering students won first place in LNG Essay competition organized by World LNG Summit in Lake Charles.
- Chemical Engineering Faculty chaired a session Biofuels design simulation and economic analysis in 2022 AIChE Annual Conference
- Chemical Engineering Faculty co-chaired the area 23B Sustainable biorefineries in 2022 AIChE Annual Conference.
- Chemical Engineering Faculty was part of technical committee for World LNG Conference hosted in Lake Charles, LA
- Chemical Engineering Faculty co-chaired a symposium for 2022 Green Chemistry and Engineering Conference.
- Chemical engineering students demonstrated STEM related experiments to middle/high school students during E-week expo at McNeese campus.
- Industry experts gave presentations to Chemical Engineering students during E-Week Conference Day.
- Chemical Engineering students demonstrated STEM related experiments to 3 schools in Calcasieu Parish.

5 Program Mission

The Department of Engineering and Computer Science provides an education in chemical, civil, electrical, and mechanical engineering that is professionally focused and practice-oriented within a student friendly environment. The department prepares our students to practice engineering, focusing on the industrial needs of the region by meeting the needs of traditional and non-traditional students through close contact with the faculty, the staff, and local industrial engineers and managers. The department maintains an up-to-date curriculum that fosters interdisciplinary teamwork, scholarly development, cooperation with regional industry, and engineering ethics.

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 CHEN 409 Coursework [Approved]

Assessment: Students' work (tests, homework, quizzes, or projects) taken from CHEN 409. 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. A benchmark will be set after the 2022-2023 academic year.

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.

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.

7.1 Data

Academic Year	Average score on PC1
2021-2022	3.1/5.00
2022-2023	3.1/5.00

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:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.0. And this criteria was met for 2022-23 academic year.

7.2 Data

Academic Year	Average score on PC2
2021-2022	3.4/5.00
2022-2023	3.2/5.00

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:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.0. And this criteria was met for 2022-23 academic year.

7.3 Data

Academic Year	Average score on PC3
2021-2022	3.3/5.00
2022-2023	2.9/5.00

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:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.0. And this criteria was not met for 2022-23 academic year. To meet this benchmark problem solving in applied differential equations in CHEN 323 class will be emphasized.

7.4 Data

Academic Year	Average score on PC4
2021-2022	2.8/5.00
2022-2023	3.1/5.00

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.

7.4.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.0. And this criteria was met for 2022-23 academic year.

7.5 Data

Academic Year	Average score on PC5
2021-2022	2.90/5.00
2022-2023	3.1/5.00

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.

7.5.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.0. And this criteria was met for 2022-23 academic year.

8 Assessment and Benchmark CHEN 407 Coursework [Approved]

Assessment: Students' work taken from CHEN 407. 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. A benchmark will be set after the 2022-2023 academic year.

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.

8.1 Data

Academic Year	Average score on PC1
2021-2022	3.33/5.00
2022-2023	3.8/5.00

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.

8.1.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.0. And this criteria was met for 2022-23 academic year.

8.2 Data

Academic Year	Average score on PC2
2021-2022	3.17/5.00
2022-2023	3.4/5.00

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.

8.2.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.0. And this criteria was met for 2022-23 academic year.

8.3 Data

Academic Year	Average score on PC3
2021-2022	3.67/5.00
2022-2023	3.0/5.00

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.

8.3.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.0. And this criteria was met for 2022-23 academic year.

9 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. A benchmark will be set after the 2022-2023 academic year.

Benchmark for PC2: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. A benchmark will be set after the 2022-2023 academic year.

Benchmark for PC3: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. A benchmark will be set after the 2022-2023 academic year.

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.

9.1 Data

Academic Year	Average score on PC1
2021-2022	4.01/5.00
2022-2023	4.84/5.00

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.

9.1.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.5. And this criteria was met for 2022-23 academic year.

9.2 Data

Academic Year	Average score on PC2
2021-2022	4.14/5.00
2022-2023	4.85/5.00

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.

9.2.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.5. And this criteria was met for 2022-23 academic year.

9.3 Data

Academic Year	Average score on PC3
2021-2022	4.10/5.00
2022-2023	4.78/5.00

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.

9.3.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.5. And this criteria was met for 2022-23 academic year.

10 Assessment and Benchmark CHEN 411 Coursework

Assessment: Students work (tests, homework, quizzes, or projects) taken from CHEN 411. 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. A benchmark will be set after the 2022-2023 academic year.

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.

10.1 Data

Academic Year	Average score on PC1
2021-2022	3.00/5.00
2022-2023	3.53/5.00

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.

10.1.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.0. And this criteria was met for 2022-23 academic year.

10.2 Data

Academic Year	Average score on PC2
2021-2022	3.83/5.00
2022-2023	4.29/5.00

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.

10.2.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.5. And this criteria was met for 2022-23 academic year.

10.3 Data

Academic Year	Average score on PC3
2021-2022	3.70/5.00
2022-2023	3.70/5.00

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.

10.3.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.5. And this criteria was met for 2022-23 academic year.

10.4 Data

Academic Year	Average score on PC4
2021-2022	4.07/5.00
2022-2023	4.06/5.00

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.

10.4.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
This first year data will be used to build a baseline for the BSChE program benchmark. The program coordinator and department head will agree on a benchmark after the 2022-23 academic year.

2022-2023:
Based on 2022-23 academic year, the benchmark for this criteria is set to 3.5. And this criteria was met for 2022-23 academic year.

End of report