



---

# Chemical Engineering [CHEG]

**Cycles included in this report:**

Jun 1, 2024 to May 31, 2025

## Program Name: Chemical Engineering [CHEG]

Reporting Cycle: Jun 1, 2024 to May 31, 2025

**1 Is this program offered via Distance Learning?**

**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 criteria to the class.

2023-2024:

- CHEN 210 - Mass and Energy Balance - Implemented hands on demonstration, which includes liquid level control in a tank and Excel project on absorption column design
- CHEN 311 - Introduced an Aspen plus design project for thermodynamic property estimation using different equations state.
- CHEN 305 - Introduced Aspen plus project for reversible reacting system design.
- CHEN 314 - Introduced Aspen plus project for continuous multi component distillation design including skeleton shortcut and rigorous level representations.
- CHEN 323 - Introduced VBA project on absorption design and cost analysis.
- CHEN 409 - Introduced PLC controller lab exercises (6) for liquid level system and controller tuning.
- Repairs on HOT unit and Glycol unit were carried out.
- Bayport Trainer controller tuning partially completed.
- Developed a new elective course on Carbon Capture and Sequestration and taught in Spring 2024.
- As part of continuous improvement, chemical engineering faculty attended ABET Workshop in Tampa, FL, April 2024.
- New Rubrics were created for ABET outcomes along with summation table to showcase the classes where the outcomes are introduced, reinforced, emphasized and assessed.

2024-2025:

- CHEN 210 Mass and Energy Balance: Excel/VBA has been utilized as a computational tool to solve Chemical Engineering problems and projects, drawing on case studies from AIChE's *Chemical Engineering Progress* (CEP), including regression analysis and ANOVA applications; Laboratory experiments and assignments have been carried out on liquid-level systems, involving tasks such as mass and energy balance calculations, residence time determination, and estimation of the time required for overflow.
- CHEN 311 Chemical Engineering Thermodynamics: Integrated Aspen Plus for the selection of appropriate thermodynamic models to estimate physical and thermodynamic properties, with validation against NIST data; **Outcome 1**: Demonstrated the ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics & **Outcome 6**: Developed and conducted experiments, analyzed and interpreted data, and applied engineering judgment to draw well-founded conclusions; Utilized Aspen Plus to develop vapor-liquid equilibrium (VLE) models, assess azeotrope formation, and validate results using literature data. Designed project components aligned with ABET outcomes, specifically:
  - CHEN 323 Engineering Analysis: Implemented numerical methods such as Newton-Raphson, Secant, Euler's method, and 4th-order Runge-Kutta within Excel and VBA to solve and simulate problems in heat transfer, reactor design, mass and energy balances, and thermodynamics, supporting ABET accreditation requirements and assessments.
  - In CHEN 460/560, the students are required to present a PPT presentation on a CCS-related topic in front of the whole class and prepare an individual final report. This activity will assist these students in preparing a better capstone design project in their senior year.
  - In CHEN 490/491, Capstone projects are identified to meet the requirements of culminating major engineering design experience that incorporates all aspects of the iterative, creative and decision-making engineering design process as well as incorporation of appropriate engineering standards and multiple constraints.

#### 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.

2023-2024:

- Chemical Engineering students participated in 2023 AIChE Annual conference, Orlando, FL and secured 20th place in Chem E Car competition.
- AIChE Chemical Engineering students hosted 2024 Southwest Regional AIChE Conference at McNeese (April 12-13, 2024) where 9 universities participated in the conference which included workshops and various student competitions. Industry in Southwest Louisiana supported by sponsoring the event.
- Chemical Engineering students participated in 2024 Southwest Regional AIChE Conference and secured 2nd place in Chem E Car competition and qualified for 2024 Annual conference, San Diego, CA. Also one student got 1st place in Technical presentation and students got 3rd place in Chem E Car safety poster presentation.
- 3 Senior Chemical Engineering students won LNG Essay competition organized by Americas & Energy Summit in New Orleans, LA.
- Chemical Engineering Faculty attended Algae biomass summit in Madison, WI October, 2023.
- Chemical Engineering Faculty chaired a session Production of low carbon fuels from biomass: Design simulation and economic analysis in 2023 AIChE Annual Conference, Florida
- Chemical Engineering Faculty co-chaired the area 23B Sustainable biorefineries in 2023 AIChE Annual Conference, Florida.
- Chemical Engineering Faculty was part of technical committee for Americas & Energy Summit Conference hosted in New Orleans, LA
- Chemical Engineering Faculty co-chaired a symposium for 2023 Green Chemistry and Engineering Conference.
- Chemical engineering students demonstrated STEM related experiments to 600 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 one school in Calcasieu Parish.
- ABET campus visit for initial accreditation took place in October 2023.

#### 2024-2025:

- Chemical Engineering students participated in the 2024 AIChE Annual conference in San Diego, CA, and secured 9th place in the Chem E Car competition.
- Chemical Engineering Students Presented their ChemE Cube 2025 Virtual Qualifying Presentation on April 25th, 2025
- Chemical Engineering Student Ms. Grace Afolabi Presented a research paper on Hydrogen Storage Through Metal-Organic Frameworks at the McNeese Undergraduate Research Symposium (MURS) and got selected to present at the ULS Academic Summit at Nicholls State University on April 10<sup>th</sup> - 11<sup>th</sup>.
- Chemical Engineering Student Mr. Carson Plaisance Presented a research paper on Ionic Liquids as Surfactants at the McNeese Undergraduate Research Symposium (MURS) and got selected to present at the ULS Academic Summit at Nicholls State University on April 10<sup>th</sup> - 11<sup>th</sup>.
- Chemical Engineering Student Mr. Mustafa Velioglu Made a Poster Presentation on Cultivating Nannochloropsis oculata Microalgae Species to Extract Total Algal Lipids and Isolate Phospholipids via Solid-Phase Extraction at the McNeese Undergraduate Research Symposium (MURS) and got selected to present at the ULS Academic Summit at Nicholls State University on April 10<sup>th</sup> - 11<sup>th</sup>.
- Chemical Engineering Student Mr. Carson Plaisance Presented a research paper on Ionic Liquids as Surfactants at the ULS Academic Summit at Nicholls State University on April 10<sup>th</sup> - 11<sup>th</sup>.
- Chemical Engineering Student Mr. Mustafa Velioglu Made a Poster Presentation on Cultivating Nannochloropsis oculata Microalgae Species to Extract Total Algal Lipids and Isolate Phospholipids via Solid-Phase Extraction at the ULS Academic Summit at Nicholls State University on April 10<sup>th</sup> - 11<sup>th</sup>.

- CHEN 407: Process Evaluation and Design: Organized a plant visit to Phillips 66 through the AIChE Student Chapter to reinforce classroom instruction, focusing on crude oil processing and characterization principles.
- Dr. Zeyad Zeitoun got the Louisiana Sea Grant Funding for the amount of \$10,000 on the topic Advanced Electrocoagulation for Industrial Wastewater Treatment: A Sustainable Solution for PFAS Removal and Water Quality Improvement”
- Ramalingam Subramaniam and Srinivasan Ambatipati Submitted a Proposal on “E-RISE RII: SHINE-LOUISIANA: Sustainable Hydrogen Initiative for a New Economy in Louisiana Via The Louisiana Green Hydrogen (LGH2) Collaboratory” to NSF Funding Amount \$380,000 (\$4M)
- Ramalingam Subramaniam, Srinivasan Ambatipati, Ahmet Manisali, Ning Zhang, Cunzhi Zhao and Vidura Thalangamaarachchige Submitted a Proposal to on “Upper-west Gulf Coast Climate and Energy Definition and Assessment Resource” NAS Funding Amount \$2,134,764 (\$20M)
- The New BSChE Program was accredited by ABET up to September 30, 2026. An Interim report to address the identified shortcomings will be submitted to ABET on July 1st 2025.
- Dr. Ahmet Manisali submitted a Proposal on " Implementation of Lab Scale Microalgae - based sustainable Aquaculture for safe Seafood Production in Southwest Louisiana (\$10,000)
- Dr. Ahmet Manisali was Awarded a Sum of \$7,000 from the Shearman Grant on the topic "Fractionation of Micralgae-Biomass-Derived Total Lipid via Sold Phase Extraction for obtaining Specific Phospholipids.
- Dr. Ramalingam Subramaniam was Awarded a Sum of \$6,400 from the Shearman Grant on the topic "Application of Ionic Liquids for Carbon Capture: A Proof-of-Concept Investigation for Collaborative Research with National Labs and Federal Funding".
- Setup McNeese-AIChE - LYB Collaboration for Middle School Outreach Activities.
- Dr. Manisali Ahmet attended the 2024 Algae Biomass Summit in Houston Texas, October 20-22, 2024
- Dr. Subramaniam chaired a session Production of low carbon fuels from biomass: Design simulation and economic analysis in the 2024 AIChE Annual Conference, San Diego, CA
- Dr. Subramaniam Chaired the Area 23B Sustainable biorefineries at the 2024 AIChE Annual Conference, San Diego, CA
- Dr. Subramaniam judged the AIChE ChemE Car poster competition at the 2024 AIChE student conference. San Diego, CA
- Five Chemical Engineering Students as part of Cowboy Energy Club attended the Gas Tech Conference in Houston (September 18 and 19 2024) and participated in Leaders of Tomorrow program.
- Chemical Engineering students as part of AIChE Student Chapter and Cowboy Energy Club have invited guest speakers from Industry to talk to the students on various topics throughout the calendar year and also participated in department/university wide events to promote Chemical Engineering program.

## 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

Assessment: Students' work (tests, homework, quizzes, or projects) taken from CHEN 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. The benchmark is an average score of 3.0 on PC1.

Benchmark for PC2: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.0 on PC2.

Benchmark for PC3: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.0 on PC3.

Benchmark for PC4: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.0 on PC4.

Benchmark for PC5: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.0 on PC5.

### 7.1 Data

Academic Year	Average score on PC1
2021-2022	3.1/5.00
2022-2023	3.1/5.00
2023-2024	3.0/5.00
2024-2025	4.3/5.0

#### 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.

2023-2024:

This criteria was met for 2023-24 academic year.

2024-2025:

This criterion was met for the 2024-25 academic year.

### 7.2 Data

Academic Year	Average score on PC2
2021-2022	3.4/5.00
2022-2023	3.2/5.00
2023-2024	3.0/5.00
2024-2025	4.8/5.0

### 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.

2023-2024:

This criteria was met for 2023-2024 academic year.

To improve the scores - A Review of mathematical concepts required for this course need to be covered at the beginning of the semester.

2024-2025:

This criterion was met for the 2024-25 academic year.

### 7.3 Data

Academic Year	Average score on PC3
2021-2022	3.3/5.00
2022-2023	2.9/5.00
2023-2024	3.0/5.00
2024-2025	2.0/5.0

### 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.

2023-2024:

This criteria was met for 2023-24 academic year.

2024-2025:

This Criterion was not met for the 2024-25 academic year.

This group of students struggles to connect theoretical concepts to practical applications, interpret and interpolate values from complex graphs or tables, and often attempt to solve problems without a solid understanding of the underlying engineering principles. An overemphasis on derivations and complex mathematics may have led them to lose sight of the physical meaning behind the equations and the importance of engineering judgment.

Recommendations:

Incorporate concept checks and interactive simulations to reinforce the physical principles behind mathematical equations.

Encourage comparison of hand calculation results with theoretical or tabulated data to strengthen their ability to evaluate accuracy and deepen understanding.

## 7.4 Data

Academic Year	Average score on PC4
2021-2022	2.8/5.00
2022-2023	3.1/5.00
2023-2024	2.8/5.00
2024-2025	4.2/5.0

### 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.

2023-2024:

This criteria was not met for 2023-24 academic year.

To improve the scores - A Review of mathematical concepts required for this course need to be covered at the beginning of the semester.

2024-2025:

This criterion was met for the 2024-25 academic year.

## 7.5 Data

Academic Year	Average score on PC5
2021-2022	2.90/5.00
2022-2023	3.1/5.00
2023-2024	2.8/5.00
2024-2025	2.1/5.0

### 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.

2023-2024:

This criteria was not met for 2023-24 academic year.

To improve the scores - A Review of mathematical concepts required for this course need to be covered at the beginning of the semester.

2024-2025:

This criterion was not met for the 2024-25 academic year.

This group of students struggles to connect theoretical concepts to practical applications, interpret and interpolate values from complex graphs or tables, and often attempt to solve problems without a solid understanding of the underlying engineering principles. An overemphasis on derivations and complex mathematics may have led them to lose sight of the physical meaning behind the equations and the importance of engineering judgment.

Recommendations:

Incorporate concept checks and interactive simulations to reinforce the physical principles behind mathematical equations.

Encourage comparison of hand calculation results with theoretical or tabulated data to strengthen their ability to evaluate accuracy and deepen understanding.

## 8 Assessment and Benchmark CHEN 407 Coursework

Assessment: Students' work taken from CHEN 407. ABET 3.3 (W) 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. The benchmark is an average score of 3.0 on PC1.

Benchmark for PC2: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.0 on PC2.

Benchmark for PC3: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.0 on PC3.

### 8.1 Data

Academic Year	Average score on PC1
2021-2022	3.33/5.00
2022-2023	3.8/5.00
2023-2024	4.26/5.00
2024-2025	5.0/5.0

### 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.

2023-2024:

This criteria was met for 2023-24 academic year.

2024-2025:

This criterion was met for the 2024-25 academic year.

## 8.2 Data

Academic Year	Average score on PC2
2021-2022	3.17/5.00
2022-2023	3.4/5.00
2023-2024	4.0/5.00
2024-2025	3.5/5.0

### 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 2022-2023 academic year.

2023-2024:

This criteria was met for 2023-2024 academic year.

2024-2025:

This criterion was met for the 2024-25 academic year.

## 8.3 Data

Academic Year	Average score on PC3
2021-2022	3.67/5.00
2022-2023	3.0/5.00
2023-2024	3.63/5.00
2024-2025	3.5/5.0

### 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.

2023-2024:

This criteria was met for 2023-24 academic year.

2024-2025:

This criterion was met for the 2024-25 academic year.

## 9 Assessment and Benchmark CHEN 491 Project and Team Survey

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. The benchmark is an average score of 3.5 on PC1.

Benchmark for PC2: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.5 on PC2.

Benchmark for PC3: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.5 on PC3.

### 9.1 Data

Academic Year	Average score on PC1
2021-2022	4.01/5.00
2022-2023	4.84/5.00
2023-2024	4.78/5.00
2024-2025	4.17/5.00

#### 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.

2023-2024:

This criteria was met for 2023-24 academic year.

2024-2025:

A slight decrease in average values compared to last year, recommend team projects in sophomore and junior classes to ensure active participation and collaboration work. This criteria was met for 2024-25 academic year.

## 9.2 Data

Academic Year	Average score on PC2
2021-2022	4.14/5.00
2022-2023	4.85/5.00
2023-2024	4.78/5.00
2024-2025	4.26/5.00

### 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.

2023-2024:

This criteria was met for 2023-2024 academic year.

2024-2025:

A slight decrease in average values compared to last year, recommend team projects in sophomore and junior classes to ensure active participation and collaboration work. This criteria was met for 2024-25 academic year.

## 9.3 Data

Academic Year	Average score on PC3
2021-2022	4.10/5.00
2022-2023	4.78/5.00
2023-2024	4.78/5.00
2024-2025	4.04/5.00

### 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 2022-2023 academic year.

2023-2024:

This criteria was met for 2023-2024 academic year.

2024-2025:

A slight decrease in average values compared to last year, recommend team projects in sophomore and junior classes to ensure active participation and collaboration work. This criteria was met for 2024-25 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 for PC1: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.0 on PC1.

Benchmark for PC2: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.5 on PC2.

Benchmark for PC3: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.5 on PC3.

Benchmark for PC4: Data will be evaluated on a 5-tier scale with 1.00 being low achievement and 5.00 being high. The benchmark is an average score of 3.5 on PC4.

### 10.1 Data

Academic Year	Average score on PC1
2021-2022	3.00/5.00
2022-2023	3.53/5.00
2023-2024	3.86/5.00
2024-2025	4.09/5.00

#### 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 2022-2023 academic year.

2023-2024:

This criteria was met for 2023-2024 academic year.

2024-2025:

This criteria was met for 2024-2025 academic year.

### 10.2 Data

Academic Year	Average score on PC2
2021-2022	3.83/5.00
2022-2023	4.29/5.00
2023-2024	4.36/5.00
2024-2025	4.14/5.00

### 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 2022-2023 academic year.

2023-2024:

This criteria was met for 2023-2024 academic year.

2024-2025:

This criteria was met for 2024-2025 academic year.

### 10.3 Data

Academic Year	Average score on PC3
2021-2022	3.70/5.00
2022-2023	3.70/5.00
2023-2024	4.41/5.00
2024-2025	3.86/5.00

### 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 2022-2023 academic year.

2023-2024:

This criteria was met for 2023-2024 academic year.

2024-2025:

Interpretation of Data and drawing appropriate conclusions can be improved. Experimental data analysis and disussion of results and emphasize on drawing conclusions from the summarized results should be included in theoretical classes leading to Chemical Engineering Lab classes. This criteria was met for 2024-2025 academic year.

### 10.4 Data

Academic Year	Average score on PC4
2021-2022	4.07/5.00
2022-2023	4.06/5.00
2023-2024	4.18/5.00
2024-2025	4.14/5.00

### 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 2022-2023 academic year.

2023-2024:

This criteria was met for 2023-2024 academic year.

2024-2025:

Interpretation of Data and drawing appropriate conclusions can be improved. Experimental data analysis and disussion of results and emphasize on drawing conclusions from the summarized results should be included in theoretical classes leading to Chemical Engineering Lab classes. This criteria was met for 2024-2025 academic year.