Engineering [BS] [ENGR]

Cycles included in this report:
Jun 1, 2024 to May 31, 2025

Program Name: Engineering [BS] [ENGR]

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

2020-2021:
Data shows the value from all courses in engineering being offered in a face-to-face environment that is better for both students and faculty.

2021-2022:
Data shows that students had some issues with transitioning back to face-to-face courses but overall is better for students and faculty.

2022-2023:
New faculty hired to help enhance the power engineering side of the electrical engineering concentration, as well as a new faculty member hired to help with the structural side of civil engineering program. Plan to add Cybersecurity Minor.

2023-2024:
New faculty hired for power engineering, greatly helped with increasing interest in the power minor and Spring 2024 power electives.
Past data show that most electrical and computer engineering students graduate in spring semesters, partially due to the prerequisite requirements of ENGR490. To give more students a chance to finish in a fall (for example in 4.5 years vs 5 years), the prerequisites were changed for electrical and computer students. All disciples will also now offer separate 490/491 sections for more flexible prerequisites and smoother assessing.
Based on surveys from the IAB, employers and alumni - as well as faculty experiences in ENGR491 and student intern feedback - the electrical concentration added ENGR101 back to the program after many years of being removed. Experience in industry-standard CAD programs and in reading drawings is a valuable addition to the concentration.
We added Civil Engineering Minor and effective from Fall 2024.
Degree plan for BSE_CPEN was updated and new courses in computer hardware and FPGA design are developed to be added to 2024-25 degree plan.

- CPEN-260 Digital System Design I
- CPEN-261 DSD Lab
- CPEN-262 Digital System Design II & Lab
- CPEN-364. Digital Circuits Design w/ FPGAs
- Sr. Design project courses for BSE_CPEN are created
- CPEN-490. Sr. Design Project I for CPEN
- CPEN-491 Sr. Design Project II for CPEN

New minor in Cybersecurity is developed and following courses are developed to support the program,

- CPEN-444 Network Security
- CPEN-474 Cyber Defense
- CPEN-475 DevOp
- CPEN-484 Cybersecurity Operation

2024-2025:
Degree plan for BSE_CIEN was updated and new courses were added in the curriculum

- ENGR 204 Advanced AutoCAD
- ENGR 301 Introduction to Construction Engineering
- CIEN 322 Subdivision Design
- CIEN 408L Structural Lab
- CIEN 424 Boundary Surveying
- CIEN 425 GPS for Land Surveyors
- CIEN 492 Engineer-in-Training (EIT) Certification Exam Preparation

The new advanced AutoCAD class will help students better understand how to read engineering drawings, which is a skill highly sought after in the industry. Additionally, the new FE prep class will support Civil Engineering students, as it is a required step toward obtaining their PE license.
A new Minor in Land Surveying has been introduced, which is open to all MSU students. Some of the new courses will also support this new minor. The new minor requires 27 credit hours.

- CIEN 322 - Subdivision Design Cr: 3
- CIEN 421 - Advanced Surveying Cr: 3
- CIEN 424 - Boundary Surveying Cr: 3
- CIEN 425 - GPS for Land Surveyors Cr: 4
- ENGR 101 - Engineering Graphics Cr: 2
- ENGR 204 - Advanced AutoCAD Cr: 3
- GEOG 231 - Geographic Information Systems I: Spatial Analysis Cr: 3
- GEOG 361 - Geographic Information Systems II: Principles and Methods Cr: 3

As described above, the BSE-CPEN degree plan changes have become part of the 2024-25 Catalog. 3 new courses with additional hands-on lab were added or replaced the existing courses or technical electives.
Also as described above, a new minor for CPEN students in Cybersecurity became part of the AY 2024-25 catalog:
This minor is open only to those students pursuing a Bachelor of Science in Chemical Engineering, Bachelor of Science in Computer Science, Bachelor of Science in Engineering, or Bachelor of Science in Mechanical Engineering.
Lastly, the new Master of Engineering with Concentration in Computer Engineering became part of the AY 2024-25 catalog:

4 Program Highlights from the Reporting Year

2020-2021:

- The LNG center for excellence received funding and construction will begin soon.
- Grant funding secured to help with power engineering curriculum.
- Grant funding secured to help update ETL and increase enrollment through updated facilities.
- Student study center nearing completion.

2021-2022:

- Grant funding secured to help with engineering measurements lab and strength of materials lab.
- Construction nearing completion of hacker space
- Student study center completed and being used successfully for students and during engineering week.
- Chemical engineering students competed in the chemE car race for the first time in many years and came in second, while coming in first in the safety category.

2022-2023:

- Board of Regents grant secured for next year to help enhance the civil engineering labs and curriculum.
- Received TASC grant to upgrade surveying and materials of constructions labs.
- Network and Security Lab is completed well as industrial process controls lab.
- Civil Engineering student chapter of ASCE presented at PCI conference, attended the Waste Water conference, secured 3rd place in NPCA Competition and came in 2nd in concrete canoe contest.
- Electrical and Computer engineering students continue working with the robotics team with computer science students.
- Several electrical, computer, and civil engineering students are taking the upcoming semester to intern in a wide variety of companies throughout the area.
- Several electrical, computer, and civil engineering students are taking the upcoming FE Prep courses in Summer.
- Drew 126 has been updated as an ancillary classroom to teach computer based courses.
- Drew 228 has been updated with 20 Computers to be used as computer based courses.
- LaSpace Senior Design undergraduate research project comprising of Electrical and Computer Engineering students secured second place in LSU Discovery Day.
- Civil Engineering students had two site visits including Dunham Price plant and Alfred Miller Facility.
- Four Guest speakers attended to talk in CIEN 403 and CIEN 419.
- Eight students in Computer Engineering successfully completed professional certifications in Linux pro, Ethical hacking and routing & switching.
- During E-Week a new activity was included to invite industry experts to give presentation to Civil, Electrical and Computer engineering students.

2023-2024:

- Several electrical, computer, and civil engineering students had valuable intern experiences in a wide variety of companies throughout the area, including Summer 2023, Fall 2023 and Spring 2024.
- Seniors in ENGR433 registered for the FE Exam, and a number of electrical, computer, and civil engineering students have taken and passed the exam.
- The LaSpace Rover Senior Design undergraduate research project comprising of Electrical and Computer Engineering (and Computer Science) students took part in LSU Discovery Day 2024.
- For the second year, an ENGR491 team of electrical students created a poster and participated in the visual display part of LSU Discover Day. In 2023, it was Mr. Garner's Industrial IoT project and in 2024, Dr. Zhao's Smart Solor project.
- Two guest speakers attended IEEE meetings in the Fall of 2023. Both were MSU grads with positions in local industry.
- The E-Week Conference included three guest speakers from each discipline, the presentations were recorded for sharing with local high school counselors, and the afternoon included expanded opportunities for mock interview sessions.
- The IEEE, ASCE, ACM, SWE and other student organizations participated in all 2023-24 MSU Preview Days as well as the expanded 2024 Commitment Day.
- Civil Engineering student chapter of ASCE presented at PCI conference in Denver, CO, attended the Waste Water conference in Holden, LA, secured 2nd place in NPCA Competition and participated in Gulf Coast Conference, New Orleans, LA and came in 1st place in Concrete Canoe Project Proposal, 3rd place Concrete Canoe Technical presentation, 3rd place Overall Concrete Canoe Competition and 3rd place in Topographic Maps (surveying competition).
- Two ASCE student members and one Civil Faculty participated and presented PCI activities at 2024 PCI Gulf South Spring Meeting, Lake Charles, LA.
- Civil Engineering group added portable ground penetrating radar, GP 8000 as part of E-Week demonstration.
- Civil Engineering students had one site visit at Alfred Miller Facility.
- Civil Engineering Faculty presented Urban Planning at LeBlanc Middle School.
- The installation of equipment is completed in ETL 118 for Soil Research Lab - supported by BOR Enhancement and TASC grants.
- Purchased SAP 2000 and CSIBridge cloud-based licenses for ETL 122.
- Civil Engineering Faculty participated in three conferences as speaker (LES Conference, Kenner, LA; J28JES Conference, Lafayette, LA; NSBE National Conference)
- Civil Engineering Faculty Participated in Professors Seminar, PCI Foundation in Miami, FL
- Guest speakers were invited to campus from Dunham Price for Pre-stressed course.
- Four speakers invited to present in ENGR 110 class.
- Two department activities (Fall food truck event and Spring Crawfish Boil) for student engagement were well attended by ENGR students and Industry members.

2024-2025:

- Farid Hosseinpour received a $167,362 BoR grant for Enhancing Civil and Structural Engineering Facilities: Advancing Material Testing and Educational Innovation at McNeese State University
- Dimitrios Dermisis received the ASCE Outstanding Civil Engineering Educator Award
- Firouz Rosti presented at the 29th Joint Engineering Societies Conference (JESC) in Lafayette
- Farid Hosseinpour, Civil Engineering Assistant Professor at McNeese State University, on receiving the Engineering Industry Advisory Board (IAB)Teaching Award of Excellence
- ETL 155 Construction lab was upgraded with equipment to help students with the concrete canoe and ETL 122 is being currently updated and used to teach the Prestressed Concrete lab. Software (SAP2000 & CSIBridge) was installed on the computers
- ASCE members proudly supported relief efforts for those impacted by Hurricanes Helene and Milton through donations
- ASCE McNeese Student Chapter participated in the ASCE Gulf Coast Conference, Mississippi State University, March 6-8, 2025
    - 2nd place in the Technical Presentation of the Concrete Canoe Competition
    - 2nd place in the Storm Water Competition
    - 2nd place in the Starkvegas Foosball Competition
    - 2nd place in the March Madness Free Throw Competition.
- Undergraduate students Brant Courville and graduate student Mani Subedi participated in the PCI Convention, Indianapolis, February 5-7, 2025
- Christian Perez Gomez, member of ASCE, received the outstanding junior award
- ASCE president Kallie Broussard visited Lake Arthur Elementary School to promote STEM and share what Civil Engineering is all about and President Kallie Broussard, Vice President Brant Courville, and member Christian Perez showed off our ASCE program and the civil engineering profession to F.K White Middle students
- Civil Engineering students participated in the March Luncheon of the ASCE Acadiana Branch
- Brant Courville (Senior) and Cristhian Perez (Junior) received the ASCE Acadiana Branch Student Scholarship Awards for the 2024-2025 school year
- Brant Courville and TJ Cormier received the 1st place on the annual McNeese Homecoming Oozeball Tournament, with the support of mechanical engineering student Ella Arabie and their four other teammates Leah Richert, Collin Peloquin, Tanner Trahan, and Bianca Barnes
- Chukwuemeka Francis (junior) interned at AECOM, Brant Courville (senior) interned at LyondellBasell Industries and Tyler Tran (junior) interned at Calcasieu Parish Police Jury.

ELEN:

<u>Dr. Zhao papers published/getting published and conferences:</u>

- 1 journal : Cunzhi Zhao and Xingpeng Li, “Hierarchical Deep Learning Model for Degradation Prediction per Look-Ahead Scheduled Battery Usage Profile”, IEEE Transactions on Smart Grid, 2024.
- 2 conference paper submitted and under review:

Jose Betancourt, Cunzhi Zhao, "Comparative Analysis of EV Battery Degradation: Real-World Data vs. Lab Simulations", TPEC 2025, Under Review.

David Okpo, Cunzhi Zhao, "Electric Vehicle Charging Fleet Optimization: Analyzing Load Distribution in the IEEE 9 Bus System", TPEC 2025, Under Review.

- Attended PESGM in July 2024 and presented a poster.
- Attended NAPS 2024 in Oct 2024 as a session Chair.
- Elias Raffoul, Mingjian Tuo, Cunzhi Zhao, Tianxia Zhao, Meng Ling, and Xingpeng Li, “Comparative Analysis of Machine Learning Models for Short-Term Distribution System Load Forecasting”, EPEC,Under Review.
- Cunzhi Zhao and Xingpeng Li, “Linearization of ReLU Activation Function for Neural Network-Embedded Optimization:Optimal Day-Ahead Energy Scheduling”, EPSR, Under Review.

Mingjian Tuo, Cunzhi Zhao, Mulan Zhang, Tao Gao, Xuequan Shang, “GNN accelerated Frequency Constrained Unit Commitment of Multi-Area Power Systems with High Penetration of Renewable Energy Sources”, IEEE Trans on sustainable energy, under Review.

-Attended TPEC 2025 with Jose Betancourt and presented a paper in Feb, 2025.

- Zhao finished the two EP grants from last year which funded two graduate students’ research work, three papers published, three conference trips and items for senior design of solar project in Spring 2024.

Garner: IEEE has been active:
- Meetings about every other week, Preview Day and Food Truck table
- Had guest speakers from Westlake and W.R. Grace, with good attendance. Northwestern Mutual (financial advisor), Westlake (power & automation talk, they were also here in the fall), some members also went to another Westlake talk set up by SWE, and we toured W.R. Grace soon after E-Week with great participation from the IEEE and Grace (including their plant manager)
- IEEE graduation cords purchased and new t-shirts purchased. The IEEE secured $5k in fund-raising from Westlake and $1k from Lotte for student conferences, including the IEEE Region 5 conference. Four seniors attended the event.
-Completed one past EP Grant (lab supplies and senior project supplies) and will finish one in 2025 with Zhao for power protection content items.
Brent's TASC request for ETL100 TV. Submitted in January and now pending.

Liu: SWE advisor, helped the club with different activities, including a demo room in E-Week.
- Completed most of a past EP Grant of purchasing lab equipment and put them into use. Purchases include: 1) FNIRSI DSO152 Oscilloscope - 2.8" TFT Handheld Digital Oscilloscope that can be brought to classroom to demo AC electricity to ELEN 210/220 and ENGR 211 students. 2) OWON VDS6102 USB PC Virtual Oscilloscope 2+1 to let students know more modern oscilloscopes and can be used as a backup to aged current oscilloscopes. 3)An iPad which is used as a storage for all electronic textbooks and used for lectures in classroom for all classes and off-campus work.
ELEN 491 Capstone Projects:
- Year #2 of the Flow Meter trainer, with new devices bought via Mitch's EP as part of the project.
- Printed circuit board (PCB) project funded by one of my old EP grants.
CPEN:
-Two (2) CPEN students are in the LaACES balloon undergraduate research project. Dr. Bei Xie will take them to LSU for thermal test and LSU Discover day symposium on April 25. They are planning to go to NASA in May for the flight.
-Four (4) CPEN Sr. students presented their undergraduate projects at McNeese URS on March 72, 25
- CPEN students participated in various E-week activities with IEEE and ACM student clubs during E-week 25.
- One graduate student working with Dr. Aghili, doing preliminary research on FPGA embedded design & applications for her Thesis.
- Student Professional Certifications: Fall 24 - Total 12 Students
- Dr. Aghili worked worked with Dr. Bei Xie to develop the Cybersecurity concentration for Computer Science program starting AY 2025-26. Some of the CPEN courses used in the CPEN Cybersecurity minor are also available as CSCI courses.

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 CIEN 419, CPEN 310, and ELEN 455 Coursework

Assessment: Students' work (tests, homework, quizzes, or projects) taken from CIEN 419, CPEN /ELEN 310, and ELEN 455. 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.

Prior to 2017-2018, the benchmark was 3.00/5.00.

7.1 Data

Academic Year	Average score on PC1
2019-2020	3.89/5.00
2020-2021	3.83/5.00
2021-2022	3.67/5.00
2022-2023	4.15/5.00
2023-2024	4.18/5.00
2024-2025	4.24/5.00

7.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met, however due to courses being taught primarily online during this academic year the increase could be due to that factor. The next academic year will show more realistic data.

2021-2022:
The benchmark was met, however it is trending on a downward slope. The department will keep an eye on this trend to see if the assessment needs to be redone or if the benchmark needs to be adjusted.

2022-2023: The benchmark was met, however it is no longer on a downward slope.

2023-2024:
The benchmark was met, with no issues present. The ELEN 455 was taught and assessed by a new instructor, and the same new instructor taught/assess ELEN310 for the CPEN results. Those results seem to include all (EE and CPEN) students, so perhaps next year with enough CPEN students, the results will include only their results in 310.

2024-2025:
The benchmark was met for the 2024-25 academic year, and is our highest in recent history. The score for CIEN 419 was 4.59/5.00, up from 4.07 last year. The ELEN 310 course results (for CPEN) are with a new instructor and may not be exactly the same assessments as in previous years.
Plan for continuous improvement: The CIEN instructor is planning to train students in Excel to perform numerical solutions alongside manual calculations and assign comparison tasks to help students evaluate the strengths and limitations of both analytical and numerical methods. The ELEN 310 instructor and program coordinators will consider whether the assessments selected in 2024-25 are the best or whether this selection can be improved to really measure student learning.

7.2 Data

Academic Year	Average score on PC2
2019-2020	4.33/5.00
2020-2021	3.79/5.00
2021-2022	3.58/5.00
2022-2023	4.00/5.00
2023-2024	4.27/5.00
2024-2025	3.90/5.00

7.2.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met, however due to courses being taught primarily online during this academic year the decrease could be due to that factor. The next academic year will show more realistic data.

2021-2022:
The benchmark was met, however it's trending in a downward direction and needs to be monitored to see if it's going to rebound or stay on its current pathway.

2022-2023:
The benchmark was met, and it is no longer trending in a downward direction. The lower numbers could have been due to virtual education.

2023-2024:
The benchmark was met, with no issues present. The ELEN 455 was taught and assessed by a new instructor, and the same new instructor taught/assess ELEN310 for the CPEN results. Those results seem to include all (EE and CE) students, so perhaps next year with enough CPEN students, the results will include only their results in 310.

2024-2025:
The benchmark was met for the 2024-25 academic year, down from last year but about average in recent history. The score for CIEN 419 was 3.92/5.00, and ELEN 310 was also low at 3.72. The ELEN 310 course results (for CPEN) are with a new instructor and may not be exactly the same assessments as in previous years. All three assessments were lower than the previous year.
Plans for continuous improvement: The CIEN instructor will require students to create diagrams or maps showing how components interact and which principles govern each part. The instructor will use these visuals in assignments and assessments to evaluate understanding beyond calculations. A typical example is the water budget in a watershed. The ELEN 310 instructor and program coordinators will consider whether the assessments selected in 2024-25 are the best or whether this selection can be improved to really measure student learning.

7.3 Data

Academic Year	Average score on PC3
2019-2020	3.72/5.00
2020-2021	3.89/5.00
2021-2022	3.74/5.00
2022-2023	3.51/5.00
2023-2024	3.70/5.00
2024-2025	3.32/5.00

7.3.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met, however due to courses being taught primarily online during this academic year the increase could be due to that factor. The next academic year will show more realistic data.

2021-2022:
The benchmark was met, and unlike other assessments in its group this assessment has seemed to normalize. Will discuss with department and see if update is needed.

2022-2023:
The benchmark was met, but the results were lower, primarily due to the civil results from CIEN419. Students had trouble with unit conversions and some had issues completing the test used for the assessment.

2023-2024:
The benchmark was met and improved as well, primarily due to an increase in the civil results. As mentioned in the last two items, ELEN455 was a new instructor/assessments and those results did go down here. ELEN310 was also a new instructor/assessments, but the results went up. The civil assessment happens to be a somewhat challenging test question, so the assessment is not always the highest. It did go up this year.

2024-2025:
The benchmark was NOT met for the 2024-25 academic year, but this is consistently one of our lowest assessments. The score for CIEN 419 was 3.00/5.00 and the ELEN 310 was 3.36/5.00, making both under the 3.5/5.0 benchmark. Again, the ELEN 310 course results (for CPEN) are with a new instructor and may not be exactly the same assessments as in previous years.
Plans for continuous improvement: The reason that the CIEN score was low was due to some unit conversions. The instructor is planning to integrate dimensional analysis into problem-solving instruction, showing how correct units validate correct application of principles. This will include step-by-step unit tracking in worked examples and require it in student solutions. Also, the instructor will provide short, formative quizzes focused solely on unit conversion and dimensional analysis. Perhaps an assessment wider than one problem on one exam can be used?
The ELEN 310 instructor and program coordinators will consider whether the assessments selected in 2024-25 are the best or whether this selection can be improved to really measure student learning.

8 Assessment and Benchmark CIEN 419, CPEN 462, and ELEN 455 Coursework

Assessment: Students work (tests, homework, quizzes, or projects) taken from CIEN 419, CPEN 462, and ELEN 455. 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.

Prior to 2017-2018, the benchmarks were 3.00/5.00.

8.1 Data

Academic Year	Average score on PC4
2019-2020	3.93/5.00
2020-2021	4.83/5.00
2021-2022	2.98/5.00
2022-2023	4.35/5.00
2023-2024	4.17/5.00
2024-2025	4.25/5.00

8.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met with the average being far above the normal average for this performance criteria. This is most likely due to the online learning mode that came about due to COVID-19 and the multiple hurricanes in the area.

2021-2022:
The benchmark wasn't met. To improve on this, the department wants one more year of data to see if this is a one time occurrence or the start of a trend.

2022-2023:
The benchmark was met and the number drastically increased, due to previous inclusion of low number from the CHEN and MEEN courses.

2023-2024:
The benchmark was once again met, with some of the three course results going up and others dropping. All were above 4/5, so no issues here. Again, we have a new instructor/assessments from ELEN455.

2024-2025:
The benchmark was met for the 2024-25 academic year. The score for CIEN 419 was 3.97/5.00, slightly down from last year, but the overall score was up.
Plans for continuous improvement: The CIEN instructor is planning to break complex problems into smaller tasks that guide students through recognizing problem types, identifying given /unknown variables, and selecting relevant principles. The plan will be to gradually increase complexity as students gain confidence and competence.
The ELEN 455 instructor commented in his ABET SLO 1e recommendations (used in this Xitracs program item) that adding a few lab integrated lectures would help the students understand the course material (lecture only course).
No changes needed for the CPEN assessments.

8.2 Data

Academic Year	Average score on PC5
2019-2020	4.00/5.00
2020-2021	4.52/5.00
2021-2022	3.05/5.00
2022-2023	3.67/5.00
2023-2024	4.35/5.00
2024-2025	4.34/5.00

8.2.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met with the average being far above the normal average for this performance criteria. This is most likely due to the online learning mode that came about due to COVID-19 and the multiple hurricanes in the area.

2021-2022:
The benchmark was barely met. The department will monitor this assessment closely to see if it continues to go down and not reach the benchmark.

2022-2023:
Again the benchmark was met and the numbers went up, due to not having MEEN and CHEN courses included.

2023-2024:
The benchmark was once again met, with some of the three course results going up and others dropping. All but ELEN455 were above 4/5, and we have a new instructor/assessments from ELEN455. Future results will be monitored in 455 for the data for items 7 and 8 here.

2024-2025:
The benchmark was met for the 2024-25 academic year. The score for CIEN 419 was 4.03/5.00, slightly less than last year. The overall score was one of the best in our report history.
Plans for continuous improvement: The CIEN instructor is planning to incorporate problems that explicitly require students to use standard reference materials (e.g., Moody diagram). The plan will be to introduce low-stakes activities early in the semester to build familiarity, with increasing complexity in later assignments. The ELEN 455 instructor commented in his ABET SLO 1e recommendations (used in this Xitracs program item) that adding a few lab integrated lectures would help the students understand the course material (lecture only course).
No changes needed from the CPEN assessment.

9 Assessment and Benchmark CIEN 403, CSCI 413, and ELEN 357 Coursework

Assessment: Students' work taken from CIEN 403/402L, CSCI 413, and ELEN 357. 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.

Prior to 2017-2018, the benchmark was 3.00/5.00.

9.1 Data

Academic Year	Average score on PC5
2019-2020	4.15/5.00
2020-2021	4.41/5.00
2021-2022	4.18/5.00
2022-2023	3.84/5.00
2023-2024	4.50/5.00
2024-2025	4.49/5.00

9.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met and exceeded by a large margin, however this could be due to the course being delivered in an online format and students not having the same amount of experience when presentation online.

2021-2022:
The benchmark was met and showed that the previous year was a spike. The department will monitor the assessment and see if it stays on this trend or if this is the start of a downward trend.

2022-2023:
The benchmark was met, but the numbers went down due to 3/5 values in ELEN357. We can look at the assessments for that course in the future.

2023-2024:
The benchmark was met with no issues. The ELEN357 results improved, and the assessment improved to measure only students' lab writing ability, not results of the entire course. The other two courses assessed, CIEN402L and CSCI413, had results that improved from 2022-23 to 2023-24. The largest change, however, was the change in ELEN357 results improving from 3/5 to 4/5, along with an improved assessment.

2024-2025:
The benchmark was met for the 2024-25 academic year. The score for CIEN 403 was 4.69/5.00, slightly down from last year, but the overall score is one of our higher for these reports.
Plans for continuous improvement: The CIEN instructor will provide early in the semester guided templates with sample specs and constraints and towards the middle of the semester the instructor will use semi-structured problem statements, requiring students to extract specs /constraints independently.
No other changes needed for the other two assessments.

9.2 Data

Academic Year	Average score on PC6
2019-2020	4.12/5.00
2020-2021	4.51/5.00
2021-2022	4.24/5.00
2022-2023	4.32/5.00
2023-2024	4.43/5.00
2024-2025	4.54/5.00

9.2.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met and exceeded by a large margin, however this could be due to the course being delivered in an online format and students not having the same amount of experience when presentation online.

2021-2022:
The benchmark was met and will continue to be monitored to see if the assessment stays in the range or goes on a downward slope.

2022-2023:
The benchmark was met. Some assessments went up and removing CHEN classes also made a difference.

2023-2024:
The benchmark was met with no issues. The ELEN357 results remained the same, but the assessment improved to measure only students' lab writing ability, not results of the entire course.

2024-2025:
The benchmark was met for the 2024-25 academic year. The score for CIEN 403 was 4.69/5.00, slightly down, but the overall score was again one of the higher recent scores.
Plans for continuous improvement: None needed.

9.3 Data

Academic Year	Average score on PC7
2019-2020	4.21/5.00
2020-2021	4.35/5.00
2021-2022	4.15/5.00
2022-2023	3.84/5.00
2023-2024	4.57/5.00
2024-2025	4.31/5.00

9.3.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met and exceeded by a large margin, however this could be due to the course being delivered in an online format and students not having the same amount of experience when presentation online.

2021-2022:
The benchmark was met and will continue to be monitored to see if it stays in the same range or takes a downward turn.

2022-2023:
The benchmark was met, but the numbers were down and down in ELEN357. We will evaluate the assessments in that course.

2023-2024:
The benchmark was met with no issues. The ELEN357 results improved, and the assessment improved to measure only students' lab writing ability, not results of the entire course.

2024-2025:
The benchmark was met for the 2024-25 academic year, with the overall score about average from previous years. The ELEN 357 instructor changed (this was also true for items 9.1 and 9.2), and so the assessments could be different. The ELEN score dropped from 4.0/5.0 to 3.89 /5.0, not a huge drop.
Plans for continuous improvement: None needed. We will continue to evaluate the results of all three courses, and consider whether all ELEN 357 assessments are the best to evaluate student learning.

10 Assessment and Benchmark ENGR 491 Project and Team Survey

Assessment: Students work (Project and Team Survey) taken from CIEN491, CPEN 491, and ELEN 491 (formerly different sections of 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.

Prior to 2017-2018, the benchmarks were 3.00/5.00.

10.1 Data

Academic Year	Average score on PC1
2019-2020	4.51/5.00
2020-2021	4.44/5.00
2021-2022	4.41/5.00
2022-2023	4.67/5.00
2023-2024	4.58/5.00
2024-2025	4.39/5.00

10.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met, however the decrease could be due to the senior research project being completely online versus face-to-face group meetings.

2021-2022:
The benchmark was met. There is a downward trend and the department may need to look into rewriting the assessment.

2022-2023:
The benchmark was met and the numbers went up this year, perhaps due to students being on campus the last few years.

2023-2024:
The benchmark was met with no issues. The EE results dropped slightly in all three of the item 10/ABET SLO5 assessments, partially a result of a few weak students taking part in multi-discipline projects. The Civil results stayed steady and the CPEN results went up, due to having two very strong students/teammates and another who more than did his part on a project.
Based on a suggestion from IRE, we will consider the suggestion to increase the benchmark from 3.50/5.00 to 4.00/5.00 to comply with ABET's recommendations regarding the Chemical Engineering, BSChE program. This will be discussed at CIP meetings during the 24-25 academic year, and if approved, applied to the current 2024-2025 plan.

2024-2025:
The benchmark (3.5/5.0) was easily met, but this (4.39/5.0) was our lowest score in recent history. These results are from peer surveys of team members, and can vary from year to year, especially if the team is composed of multi-disciplinary groups of engineering students who don't know each other as well. These groups tend to be more honest, or at least less-forgiving of team mates from their own engineering area.
Continuous Improvement plan: No changes are needed now, even with the lower scores. As an example of a score which is lower, but there is no need to change anything: the CPEN students scores 5.0/5.0 last year, but only 4.2/5.0 this year. There are more CPEN students now on more projects, and even with the 4.2 score, none of them received a score lower than 4/5.
In 2024 to combat the projects getting behind, the ELEN instructor added more % to a successful ending of the project and made the monthly scores include individual work. Most of the projects stayed on target this year, other than those affected by MSU ordering. In the end, having a successful project with most of the members "pulling their own weight" is all we can ask.

10.2 Data

Academic Year	Average score on PC2
2019-2020	4.56/5.00
2020-2021	4.47/5.00
2021-2022	4.52/5.00
2022-2023	4.75/5.00
2023-2024	4.65/5.00
2024-2025	4.53/5.00

10.2.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met, however the decrease could be due to the senior research project being completely online versus face-to-face group meetings.

2021-2022:
The benchmark was met. The assessment has stayed in the same range for several years. A rewrite of the assessment may be needed.

2022-2023:
The benchmark was met and the numbers went up, primarily due to not including the CHEN section of ENGR491.

2023-2024:
The benchmark was met with no issues. The EE results dropped slightly in all three of the item 10/ABET SLO5 assessments, partially a result of a few weak students taking part in multi-discipline projects. The Civil results stayed steady and the CPEN results went up, due to having two very strong students/teammates and another who more than did his part on a project.

2024-2025: Similar comments to item 10.1.
The benchmark (3.5/5.0) was easily met, but this (4.53/5.0) was our lowest score in recent history. These results are from peer surveys of team members, and can vary from year to year, especially if the team is composed of multi-disciplinary groups of engineering students who don't know each other as well. These groups tend to be more honest, or at least less-forgiving of team mates from their own engineering area.
Continuous Improvement plan: No changes are needed now, even with the lower scores. As an example of a score which is lower, but there is no need to change anything: the CPEN students scores 4.67/5.0 last year, but only 4.4/5.0 this year. There are more CPEN students now on more projects, and even with the 4.4 score, none of them received a score lower than 4.0/5.0.
In 2024 to combat the projects getting behind, the ELEN instructor added more % to a successful ending of the project and made the monthly scores include individual work. Most of the projects stayed on target this year, other than those affected by MSU ordering. In the end, having a successful project with most of the members "pulling their own weight" is all we can ask.

10.3 Data

Academic Year	Average score on PC3
2019-2020	4.55/5.00
2020-2021	4.49/5.00
2021-2022	4.51/5.00
2022-2023	4.71/5.00
2023-2024	4.58/5.00
2024-2025	4.39/5.00

10.3.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met, however the decrease could be due to the senior research project being completely online versus face-to-face group meetings.

2021-2022:
The benchmark was met. The numbers are in the same range as several of the past years. The department will need to look into rewriting the assessment.

2022-2023:
The benchmark was met and the numbers went up.

2023-2024:
The benchmark was met with no issues. The EE results dropped slightly in all three of the item 10/ABET SLO6 assessments, partially a result of a few weak students taking part in multi-discipline projects. The Civil results stayed steady and the CPEN results went up, due to having two very strong students/teammates and another who more than did his part on a project.
Based on a suggestion from IRE, we will consider the suggestion to increase the benchmark from 3.50/5.00 to 4.00/5.00 to comply with ABET's recommendations regarding the Chemical Engineering, BSChE program. This will be discussed at CIP meetings during the 24-25 academic year, and if approved, applied to the current 2024-25 plan.
Although the analysis is the same for items 10.1.1 and 10.3.1, there is a reason: these results are based on peer review questions in the Capstone course, so if a student is not doing their part, they often get lower results form multiple parts of the survey. Those multiple questions are used for the multiple parts of item 10.

2024-2025:
The benchmark (3.5/5.0) was easily met, but this (4.39/5.0) was again our lowest score in recent history. These results are from peer surveys of team members, and can vary from year to year.
Continuous Improvement plan: No changes are needed now, even with the lower scores. In 2024 to combat the projects getting behind, the ELEN instructor added more % to a successful ending of the project and made the monthly scores include individual work. Most of the projects stayed on target this year, other than those affected by MSU ordering. In the end, having a successful project with most of the members "pulling their own weight" is all we can ask.

11 Assessment and Benchmark CIEN 403 and ELEN 341 Coursework

Assessment: Students work (tests, homework, quizzes, or projects) taken from CIEN 403 and ELEN 341. 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.

Prior to 2017-2018, the benchmark was 3.00/5.00.

11.1 Data

Academic Year	Average score on PC1
2019-2020	3.67/5.00
2020-2021	4.22/5.00
2021-2022	3.62/5.00
2022-2023	3.63/5.00
2023-2024	4.74/5.00
2024-2025	4.68/5.00

11.1.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met, however for this performance criteria had no data gathered for chemical engineering students. This would explain the increase of the average, since the weight of chemical engineering students is the second largest in ENGR.

2021-2022
The benchmark was met; however, it is trending downward. The department will need one more year of data since the 20-21 academic year was taught primarily online as well as missing some data.

2022-2023:
The benchmark was met and the numbers were about the same as in previous years.

2023-2024:
Good numbers vs previous years, and the benchmark was met in all assessments (Civil, ELEN, and CPEN). This was a new assessment for the CPEN and ELEN starting in Spring 2022 and it is an on-line safety quiz done near the end of the semester. The results will typically be good each year, but can change due to how many students take the quiz and how motivated they are to raise their grades. This change from a previous inferior assessment was a highlighted SLO change for the ABET 2022 visit.
Based on a suggestion from IRE, we will consider the suggestion to increase the benchmark from 3.50/5.00 to 4.00/5.00 to comply with ABET's recommendations regarding the Chemical Engineering, BSChE program. This will be discussed at CIP meetings during the 24-25 academic year, and if approved, applied to the current 2024-25 plan.

2024-2025:
The benchmark was met for the 2024-25 academic year, with one of the higher scores in recent history.
Plans for continuous improvement: No changes needed.

11.2 Data

Academic Year	Average score on PC2
2019-2020	4.11/5.00
2020-2021	4.54/5.00
2021-2022	4.16/5.00
2022-2023	4.75/5.00
2023-2024	4.58/5.00
2024-2025	4.79/5.00

11.2.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met, however for this performance criteria had no data gathered for chemical engineering students. This would explain the increase of the average, since the weight of chemical engineering students is the second largest in ENGR.

2021-2022:
The benchmark was met. The department would like one more year of data to see a more realistic trend since the 20-21 and 19-20 academic years had many factors that could impair the accuracy of the benchmark.

2022-2023:
The benchmark was met and the numbers were very strong continuing to show improved results with regular labs on campus. Students have improved lab skills with the return to campus.

2023-2024:
The benchmark was met in all assessments, continuing to show improved results with regular labs on campus. The civil results did drop a bit from last year. Item 11.2 is based on actual lab reports from ELEN and CPEN students, and while we spend quite a bit of time in class and lab improving our lab skills, lab report writing, and discuss analysis items, students sometimes make mistakes or try to complete labs close to deadlines. Some variance is expected from year to year, but we continue to focus on lab skills.
The data for CIEN (civil) students dropped, and since it is based on a particular lab report, the CIP meetings will include time to discuss this lab and the lower results from that lab, as compared to other labs assessed.
Based on a suggestion from IRE, we will consider the suggestion to increase the benchmark from 3.50/5.00 to 4.00/5.00 to comply with ABET's recommendations regarding the Chemical Engineering, BSChE program. This will be discussed at CIP meetings during the 24-25 academic year, and if approved, applied to the current 2024-25 plan.

2024-2025:
The benchmark was met for the 2024-25 academic year, with the highest score in recent history.
Plans for continuous improvement: None needed.

11.3 Data

Academic Year	Average score on PC3
2019-2020	3.55/5.00
2020-2021	4.05/5.00
2021-2022	3.86/5.00
2022-2023	5.00/5.00
2023-2024	4.84/5.00
2024-2025	4.87/5.00

11.3.1 Analysis of Data and Plan for Continuous Improvement

2020-2021:
The benchmark was met. However, the data was obtained during an academic year that students had primarily online courses, in courses that are normally offered in a face-to-face environment. The benchmark/assessment needs to be looked at closely in 2021-2022.

2021-2022:
The benchmark was met. For this assessment the department needs one more semester of data to see if any changes are needed, due to the "lurking variable" qualities of the 19-20 and 20-21 academic years.

2022-2023:
The benchmark was met and the numbers were very strong. Students have improved lab skills with the return to campus.

2023-2024:
The benchmark was met in all assessments, continuing to show improved results with regular labs on campus. 11.3 is based on actual lab reports from ELEN and CPEN students, and while we spend quite a bit of time in class and lab improving our lab skills, lab report writing, and discuss analysis items, students sometimes make mistakes or try to complete labs close to deadlines. Some variance is expected from year to year, but we continue to focus on lab skills and these results are good for ELEN and CPEN students.
For Civil students the lab average for this data was the 2nd highest of four assessed, and the average was above a 96%.
Based on a suggestion from IRE, we will consider the suggestion to increase the benchmark from 3.50/5.00 to 4.00/5.00 to comply with ABET's recommendations regarding the Chemical Engineering, BSChE program. This will be discussed at CIP meetings during the 24-25 academic year, and if approved, applied to the current 2024-25 plan.

2024-2025:
The benchmark was met for the 2024-25 academic year, with the second-highest score in recent history.
Plans for continuous improvement: None needed.

11.4 Data

Academic Year	Average score on PC4
2019-2020	3.99/5.00
2020-2021	4.05/5.00
2021-2022	4.17/5.00
2022-2023	4.28/5.00
2023-2024	4.15/5.00
2024-2025	4.44/5.00

11.4.1 Analysis of Data and Plan for Continuous Improvement

2021-2022:
The benchmark was met. The department wants to see if the upward trend holds for the next academic year.

2022-2023:
The benchmark was met and the numbers continued to go up. This PC tends to be lower, since it involves lab analysis vs. measurement.

2023-2024:
The benchmark was met and the numbers are consistently around 4.00/5.00 from year to year. This PC tends to be lower, since it involves lab analysis vs. measurement, and the EE students did worse than normal (3.33/5.00). The ELEN students (nine assessed) in the class scored lower on this assessment than the CPEN students (five assessed) in the same lab and class, and that is due to 2-3 very outstanding CPEN students. All students assessed for ELEN and CPEN have the same lecture and lab, so differences are due to individual student performance.

As stated in other item 11 analysis, we spend a lot of time in class and lab discussing labs, how to evaluate date, how to evaluate errors, but analysis is more difficult than presenting data or computations.

For Civil students the lab average for this data was the second lowest of four assessed, but the average was still above 90%. This doesn't appear to be an issue.

Based on a suggestion from IRE, we will consider the suggestion to increase the benchmark from 3.50/5.00 to 4.00/5.00 to comply with ABET's recommendations regarding the Chemical Engineering, BSChE program. This will be discussed at CIP meetings during the 2024-2025 academic year, and if approved, applied to the current 2024-2025 plan.

2024-2025:
The benchmark was met for the 2024-25 academic year, with the highest score in recent history. This year, the ELEN students (eleven assessed) in the class scored HIGHER on this assessment than the CPEN students (five assessed) in the same lab and class, reversing the results from last year. All students assessed for ELEN and CPEN have the same lecture and lab, so differences are due to individual student performance.
Plan for Continuous Improvement: The ELEN and CPEN students have a lot of time in class and lab discussing labs, how to evaluate data, how to evaluate errors, but analysis is more difficult than presenting data or computations. Some students still don't understand the fine points of the results or understand, but do not correctly state the analysis issues. We will continue to work on understanding and evaluating data and results in ELEN 340 and 341 labs, and will continue to assess the results of 341 labs. No changes needed.