



Program Name	Date Completed
Master of Science in Industrial and Systems Engineering (MSISE)	June 1, 2026
Report Completed By	Report Contributors
Leonardo Bedoya-Valencia	Himadri Sen Gupta
Brief Statement of Program Mission and Goals	
<p>Mission: The Master of Science in Industrial and Systems Engineering (MSISE) program at CSU Pueblo prepares students for advanced projects in industrial engineering and operations. The program combines the study of industrial and systems engineering courses, so that students may understand core knowledge to apply methods and tools to design and analyze complex, human-machine systems.</p> <p>Goals:</p> <ol style="list-style-type: none"> 1. Students will develop knowledge and skills in the disciplines of industrial and systems engineering studies to professional levels in the following areas: manufacturing and service industries, health care systems, governmental agencies, and non-profit organizations. 2. Students will apply fundamental industrial and systems engineering knowledge in the areas of facility planning and design and operations planning and control and use fundamental industrial engineering tools including optimization and simulation. 3. Students will be ready to advance their careers by pursuing advanced degrees, especially at the doctoral level. 	

Table I Closing the Loop

Report on at least one data-informed change to your curriculum during AY 2025-2026 that was implemented to improve student learning, in response to prior assessment cycles or other data.

A. Describe issues or SLOs addressed in the AY 2025-2026 cycle. Paste SLOs verbatim below.
Communicate effectively in writing and orally.
B. In which prior academic year and semester was this SLO last assessed to generate data that informed the change(s) this year?
Fall 2025 and Spring 2026.
C. What were the recommendations for change in the previous cycle?
Stress the importance of proper referencing, articulation, organization, neatness, grammar and spelling, writing style, document formatting when writing academic reports.



D. How were the recommendations for change acted upon?
Training sessions with the Library and the Writing Center on writing, proper referencing, and use of on campus databases for literature review. Working sessions in the MSISE courses intended to teach students to prepare reports and presentations of research projects.
E. How did the change(s) implemented impact student learning? If the change was not effective, what are the next steps or new recommendations?
All MSISE and MSE students continue writing their research reports by following the Institute of Electric and Electronics Engineering (IEEE) style and referencing format. Additionally, through the library training, the MSISE and MSE students can use software to prepare the references in their written reports.

Enter Comments on Table I Closing the Loop Below
<p>The MSISE program completed a comprehensive external review in Spring 2025, conducted by Dr. Abhijit Gosavi (Missouri University of Science and Technology). The review concluded that the program exceeds expectations in nearly all aspects, including a strong curriculum aligned with the institutional mission, well-qualified faculty, low student-to-faculty ratios that support engagement, an elaborate and systematic process for assessing student learning outcomes, adequate physical and library resources, and a high graduation rate. The reviewer noted that the MSISE is the only program in a large geographical region preparing students for doctoral studies in industrial engineering and is recognized in the Western Regional Graduate Program (WRGP) register. Additionally, the School of Engineering successfully hired a new tenure-track industrial engineering faculty member who joined Fall 2025 and now teaches approximately half of the MSISE courses, allowing the Program Director to return to a regular teaching load and focus on enrollment growth and curriculum modernization.</p> <p>The proposed actions include continuing to leverage the new faculty hire to expand recruitment, program promotion, and curriculum modernization efforts. Maintain the systematic assessment process praised in the external review, including the annual faculty meeting to review rubric-based course results, student survey feedback, and exit interview insights.</p>
<p>Some of the challenges for the MSISE include:</p> <ol style="list-style-type: none"> 1. Improve the performance of master's students on outcome 3, Communicate effectively in writing and orally. 2. Address declining MSISE enrollment. Based on the external reviewer's recommendations, the following curriculum changes can be implemented to enhance the program's appeal and alignment with current industry trends: (i) enhance data analytics and artificial intelligence integration by introducing a core course on data analytics alongside the existing AI elective; (ii) develop and require a dedicated software-focused course covering Python and MATLAB, leveraging the link to existing courses in Operations Research, Simulation, and Operations Planning and Control; and (iii) rebrand and adjust the curriculum (e.g., renaming Operations Planning and Control to Supply Chain Management, renaming Operations Research to Optimization, revising Quality Control and Reliability to include Six Sigma and Lean, and modernizing manufacturing process electives to emphasize smart manufacturing and digital twins).



The proposed actions include: 1. Keep working jointly with the Library and the Writing Center to provide workshops to all master's students on writing, using academic resources, and proper referencing when preparing research reports. 2. Initiate discussions within the School of Engineering during Fall 2026 on the curriculum changes proposed by the external reviewer, beginning with the data analytics and software-focused course additions. 3. Explore the feasibility of an online or asynchronous MSISE delivery format to broaden accessibility and address the enrollment challenge, as recommended by the external reviewer. 4. Resume annual meetings with the Industrial Advisory Board (IAB) to obtain current industry input on curricular relevance.



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Table II Annual assessment of Student Learning Outcomes (SLOs) in AY 2025-26

1. Include information to share assessment processes, results, and recommendations for improved student learning. Copy this table for each assessed outcome.

A. Program SLO(s) assessed in this cycle. Copy the SLOs verbatim from the assessment plan.
Apply industrial engineering knowledge in facility design, operations planning, operations research, and simulation.
B. Semester and year this SLO was previously reported on before this cycle.
Fall 2025 and Spring 2026.
C. Describe the assessment method for this SLO(s).
Methods: EN 571 Operations Research and EN 575 Facilities Planning and Design (Fall 2025), and EN 577 Operations Planning and Control Spring 2026). Rubrics: Design Strategy, Solutions, and Tools.
D. Described student group(s) assessed. Provide the number of students or number of artifacts assessed.
In EN 575, three (3) MSE graduate students were enrolled in Fall 2025. In EN 571, three (3) MSISE graduate students were enrolled in Fall 2025. In EN 577, one (1) MSISE graduate student was enrolled in Spring 2026.
E. Explain the expected proficiency level and proportion of students who should reach this level.
Eighty percent (80%) or more of the students should meet or exceed expectations.
F. Provide Assessment results and number of students who met defined proficiency level.
In the research project report composed of a literature review, a detailed review and the replication and expansion of a current topic on IE, 100% of the students in EN 575 were able to demonstrate their knowledge on IE when dealing with current applied research problems. In EN 571, 100% of the students demonstrated their ability to formulate, solve, and interpret linear and integer programming models, including duality and sensitivity analysis, through homework assignments and a group project addressing real applied problems in industrial engineering. In EN 577, the student met the expectation by successfully completing assignments and a semester project involving supply-chain planning, forecasting, and inventory analysis using modern computational tools.



G. Describe what the results or trends indicate about student performance.
Since 100% of the students performed well; we conclude that the goal was met.
H. Describe program level changes/improvements planned for next AY (2026-2027?) which are informed by this assessment.
The course instructors continue to guide the students to focus on research problems related to contemporary issues by using both conferences and scholarly journals dealing with industrial and systems engineering.

A. Program SLO(s) assessed in this cycle. Copy the SLOs verbatim from the assessment plan.
Apply engineering principles in the design and analysis of a system or process to meet specified needs.
B. Semester and year this SLO was previously reported on before this cycle.
Fall 2025.
C. Describe the assessment method for this SLO(s).
Methods: EN 571 Operations Research (Fall 2025) and EN 575 Facilities Planning and Design (Fall 2025). Rubrics: Design Strategy and Constraints and Variables.
D. Described student group(s) assessed. Provide the number of students or number of artifacts assessed.
In EN 575, three (3) MSE graduate students were enrolled in Fall 2025. In EN 577, one (1) MSISE graduate student was enrolled in Spring 2026.
E. Explain the expected proficiency level and proportion of students who should reach this level.
Eighty percent (80%) or more of the students should meet or exceed expectations.
F. Provide Assessment results and number of students who met defined proficiency level.
Hundred percent (100%) of the students in EN 575 were able to understand and solve problems both in manufacturing and services industries by using optimization and programming. In EN 571, 100% of the students were able to formulate and solve constrained optimization problems for system design, including resource allocation, scheduling, and network design, using both algebraic and software-based methods. In EN 577, the student was able to design and analyze an integrated supply-chain system, applying forecasting, inventory, and planning models to a real-world scenario.
G. Describe what the results or trends indicate about student performance.
All students (100%) performed well. We conclude that the goal was met.
H. Describe program level changes/improvements planned for next AY (2026-2027?) which are informed by this assessment.
Students continue to be offered problems from real applied research existing in the most recent literature presented in both conferences and scholarly journals dealing with industrial and systems engineering.



A. Program SLO(s) assessed in this cycle. Copy the SLOs verbatim from the assessment plan.
Communicate effectively in writing and orally.
B. Semester and year this SLO was previously reported on before this cycle.
Fall 2025 and Spring 2026.
C. Describe the assessment method for this SLO(s).
Methods: Reports and Presentations in EN 520 (Spring 2026) and 593 (Fall 2025) Rubrics: <i>Written:</i> Articulation, organization, neatness, grammar and spelling, writing style, document formatting. <i>Oral:</i> Delivery, length and detail, mechanics, dialect, visual aids, appearance, and listening and response to questions.
D. Described student group(s) assessed. Provide the number of students or number of artifacts assessed.
In EN 593, six (6) MSE and two (2) MSISE graduate students were enrolled during the Fall 2025. In EN 520, one (1) MSISE and two (2) MSE graduate students were enrolled during Spring 2026.
E. Explain the expected proficiency level and proportion of students who should reach this level.
Eighty percent (80%) or more of the students should meet or exceed expectations.
F. Provide Assessment results and number of students who met defined proficiency level.
The students in EN 593 wrote literature reviews, academic critiques on thesis and dissertations, and did presentations each on a potential topic for their master thesis. A hundred percent (100%) of the students exceeded the expectation for this SLO. In EN 520, the students met the expectations for the research project presentations. The students in EN 520 wrote and presented a research project composed of a literature review, a detailed analysis and the replication and expansion of a current problem on IE solved by using simulation.
G. Describe what the results or trends indicate about student performance.
Since 100% of the students performed well, we conclude that the goal was met. Instead of course specific student surveys in both EN 520 and EN 593, feedback through the grading method was given to the students.
H. Describe program level changes/improvements planned for next AY (2026-2027?) which are informed by this assessment.
Keep on encouraging students in the EN 593 Graduate Seminar and EN 520 Simulation Experiments to work and use proper referencing in their academics reports including research papers and thesis. Additionally, students were encouraged to use the Writing center for editing their works.



Enter Comments on Table II AY 2026 Assessment Below

In the previous academic year (2024-2025), the school of Engineering was supposed to perform a review of the assessment procedure for the MSISE program. This review did not take place as there was only one faculty in the program. For the incoming academic year 2026-2027, we will conduct the review as there is a new IE faculty teaching about half of the courses for the MSISE. Also, similarly to the last academic year (2024-2025), most of the MSISE students are 3+2 students. For this reason, the student learning outcome 3, Communicate effectively in writing and orally, was highlighted as a priority for assessment in the MSISE program again. In particular, the main point was on performing literature review and using proper referencing when writing and presenting research projects. In the most recent four assessment cycles, in collaboration with the Library and the Writing Center, the performance of the MSISE students has improved substantially. Most of the students have written master thesis and their articulation, organization, neatness, grammar and spelling, writing style, and document formatting exceed expectations.