Academic Program Assessment Report for AY 2022-2023 **Program:** M.S. in Mechatronics Engineering

(Due: June 1, 2023) **Date report completed:** May 26, 2023

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Please describe the 2022-2023 assessment activities and follow-up for your program below. Please complete this form for each undergraduate major, minor, certificate, and graduate program (e.g., B.A., B.S., B.A.S, M.S.) in your department. Please copy any addenda (e.g., rubrics) and paste them in this document, save and submit it to both the Dean of your college/school and to the Assistant Provost as an email attachment before June 1, 2023. You'll also find this form on the assessment website at https://www.csupueblo.edu/assessment-and-student-learning/resources.html. Thank you.

Brief statement of Program mission and goals: The MSME program prepares students from diverse educational backgrounds to function as engineers in advanced projects in mechatronics and to continue their studies and obtain other advanced degrees especially at the doctoral level.

I. Assessment of Student Learning Outcomes (SLOs) in this cycle. Including processes, results, and recommendations for improved student learning. Use Column H to describe improvements planned for 2023-2024 based on the assessment process.

A. Which of the program SLOs were assessed during this cycle? **Please include the outcome(s) verbatim from the assessment plan.**	B. When was this SLO last reported on prior to this cycle? (semester and year)	C. What method was used for assessing the SLO? **Please include a copy of any rubrics used in the assessment process.**	D. Who was assessed? Please fully describe the student group(s) and the number of students or artifacts involved (N).	E. What is the expected proficiency level and how many or what proportion of students should be at that level?	F. What were the results of the assessment? (Include the proportion of students meeting proficiency.)	G. What were the department's conclusions about student performance?	H. What changes/improvements to the program are planned based on this assessment?
Analyze and/or design a mechatronic system	Spring 2022	**Methods**: EN 563 Final Course Exam and/or Project Reports	Twelve MSME second year graduate students who	At least 80% of the students should meet	All students (100%) were able to analyze and/or design a mechatronic	The students' performance was excellent. However, the sample size (12)	Since Apporto (remote access to MatLab and RobotStudio) became available, additional labs and exercises will be required since students now can

		Rubrics: Design Strategy, Solutions, and Tools (See the Assessment Plan)	were enrolled in Spring 2023	or exceed expectations	system. Students' designs demonstrated correct design strategies (Final), solutions (Final), and the use of computer tools like MATLAB (Homework Assignments).	was still too small for a valid statistical analysis. This will most likely continue.	access lab software from anywhere.
Apply advanced engineering principles in the design and analysis of a system or process to meet specified needs	Spring 2022	**Methods**: EN 561 Final project and/or Homework, EN 513 Homework/ Mini-Projects, and Final Project **Rubrics**: Design Strategy and Constraints (See the Assessment Plan)	In EN 561 there were ten students enrolled in Fall 2022. EN 513 had ten MSME student in Spring 2023.	At least 80% of the students should meet or exceed expectations	As in the previos year, all students in EN 561 were able to apply correct state-space design strategy under given constraints. They were able to demonstrate their knowledge when solving complicated problems. All students in EN513 were capaple of applying	All MSME students (100%) in EN 561 and EN 513 performed well. However, again, no firm conclusions could be reached due to the small sample size (10).	A new AI lab has been established. When ready, some new practical labs for EN 513 will be developed. Since Apporto (remote access to MatLab) became available, additional labs and exercises will be required since students now can access lab software from anywhere.

					appropriate modern AI/ML methods, tools and technologies to solve engineering problems, analyze data, and interpret restults.		
Communicate effectively in writing and orally.	Spring 2022	**Methods**: : EN 593: Written and oral presentations EN 507: Project report evaluation EN 563: Review paper evaluation **Rubrics**: *Written*: Articulation, organization, neatness, grammar and spelling, writing style, document formatting, and proper referencing of the sources. *Oral*: Delivery,	Nine MSME first-year graduate students who were enrolled in EN 593 (Fall 2022), Eleven MSME graduate students who were enrolled in EN 507 (Fall 2022), Twelve MSME graduate students who were enrolled in EN 563 (Spring 2023)	At least 80% of the students should meet or exceed expectations	The students in EN 507 wrote a project report. They all (100%) exceeded the expectation for this SLO. The students in EN 563 wrote a review paper on a robotics topic. They all (100%) met the expectation for this SLO. The students in EN 593 wrote literature reviews, academic critiques on thesis and disssertations, and did presentations	All MSME students met or exceeded expectations for this SLO. In EN 593, instead of course specific student surveys, feedback through the grading method was given to the students.	In EN 563, a review paper will be required again and the hands-on robotics labs/projects will be replaced by a simulated robotic labs not requiring a lab report. In EN 593, students will receive continous encouragement in using proper referencing in their academics reports including research papers and thesis. Additionally, students will be encouraged to use the Writing Center for editing their work.

		length and detail, mechanics, dialect, visual aides, appearance, and listening and response to questions			each on a potential topic for their master thesis. A 100% of the students exceeded the expectation for this SLO.		

Comments on part I: While the number of students increased dramatically, we are still a few students away from being able to use descriptive statistics in any meaningful way.

II. Closing the Loop. Describe at least one data-informed change to your curriculum during the 2022-2023 cycle. These are those that were based on, or implemented to address, the results of assessment from previous cycles.

A. What SLO(s) or other issues did you address in this cycle? **Please include the outcome(s) verbatim from the assessment plan.**	B. When was this SLO last assessed to generate the data which informed the change? Please indicate the semester and year.	C. What were the recommendations for change from the previous assessment column H and/or feedback?	D. How were the recommendations for change acted upon?	E. What were the results of the changes? If the changes were not effective, what are the next steps or the new recommendations?
Analyze and/or design a mechatronic system	Spring 2022	There were no recommendations for change.	N/A	N/A
Apply advanced engineering principles in the design and	Spring 2022	For EN513, a synchronized online teaching method was used for Spring 21. We can continue offering this class	Face-to-face method of content delivery only was implemented due to the	The mixed method (synchronous and f2f) was largely abandoned. However, it is recommended that this method be used in

analysis of a system or process to meet specified needs		using remote learning pedagogy and techniques.	university requirements and directives.	some special cases (snow days, faculty absence, etc.).
Communicate effectively in writing and orally	Spring 2021	In EN 563, with encouragements in EN 593, a set of instructions on writing review papers will be distributed to the students. For EN 593, the instructor will stress the importance of proper referencing, articulation, organization, neatness, grammar and spelling, writing style, document formatting when writing academic reports.	In EN 563, a set of instructions on writing review papers was distributed and discussed in class. In EN 593, the instructor conducted training sessions with the Library and the Writing Center on writing, proper referencing, and use of on campus databases for literature review.	A discussion on the report writing helped with this SLO, where all students in EN 563 met or exceeded expectations. In EN 593, all students are now writing their reports by following the IEEE style and referencing format. Aditionally, through the library training, the students are capable of using software to prepare the references in their written reports.

Comments on part II: