



Academic Program Assessment Report for AY 2018-2019

Program: _____ MS Engineering _____

(Due: May 24, 2019)

Date report completed: ___ May 24, 2019 ___

Completed by: _____ Nebojsa Jaksic _____

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Please describe the 2018-2019 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., 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, 2018. 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 MSE program prepares students from diverse educational backgrounds to function as engineers in advanced projects in mechatronics and railroad engineering and to continue their studies and obtain other advanced degrees especially at the doctoral level. The MSE program provides advanced education in engineering, currently in two emphasis areas: mechatronics and railroad engineering. Mechatronics combines mechanical and electrical engineering with computers to create intelligent machines... Railroad engineering combines civil, mechanical, electrical, and industrial engineering in solving engineering problems for the railroad industry.

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 2018-2019 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 <u>last</u> 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 <u>program</u> are planned based on this assessment?
Analyze and/or design a	Spring 2019	Methods: EN 563 Final	Two MSE second year	80% or more of the	100% of students were able to	The students' performance was	One change is planned for EN 563. The

mechatronic system		Course Exam and/or Project Reports Rubrics: Design Strategy, Solutions, and Tools	graduate students who were enrolled in Spring 2019	students should meet or exceed expectations	analyze and/or design a mechatronic system. Students' designs demonstrated correct design strategies (Final), solutions (Final), and the use of computer tools like MATLAB (Projects). Exit interviews were administered	excellent. However, again, the sample size (2) was too small for a valid statistical analysis.	prerequisite requirement of EN 462/562 will be eliminated since the EN 563 course will not use the knowledge from EN 462/562. This was based on Exit Interviews where some students pointed out that the prerequisite course was not necessary.
Apply advanced engineering principles in the design and analysis of a system or process to meet specified needs	Spring 2019	Methods: EN 561 Final and/or Homework, EN 513 Final, Homework, and/or Project Reports Rubrics: Design Strategy and Constraints	In EN 561 there were two students enrolled in Fall 2018. EN 513 had one student in Spring 2019.	80% or more of the students should meet or exceed expectations	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. The same applies for the EN 513 student. All of the MSE students were successful.	All MSE students (100%) in EN 561 and EN 513 performed well. However, no firm conclusions could be reached due to the small sample size.	The Railroad Engineering emphasis is placed on hold due to lack of students and support from local industry.
Communicate effectively in writing and orally.	Spring 2019	Methods: EN 593: Paper Evaluation and/or Presentation	Three MSE second-year graduate students who were	80% or more of the students should meet or exceed	Students in EN 593 wrote proposals for potential thesis topics. All MSE graduate students	100% of students met or exceeded expectations for this SLO.	No changes to the program are planned at this time.

		Evaluation EN 507: Presentation Evaluation and/or Project report evaluation Rubrics: <i>written:</i> Articulation, organization, neatness, grammar and spelling, writing style, document formatting <i>Oral:</i> Delivery, length and detail, mechanics, dialect, visual aides, appearance, and listening and response to questions	enrolled in EN 593 (Fall 2017) EN 507 (Fall 2018) was cancelled.	expectations	(100%) met and/or exceeded the expectation for this SLO.		
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Comments on part I:

We will try to increase enrollment by offering a 3+2 structure. The 3+2 program has been approved and it will be fully implemented next school year.

Recruitment efforts are also increased. We are trying to recruit from Iraq, Serbia, India and China.

II. Closing the Loop. Describe at least one data-informed change to your curriculum during the 2018-2019 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 2017	No changes were recommended.	No changes were implemented.	All students met or exceeded expectations.
Apply advanced engineering principles in the design and analysis of a system or process to meet specified needs	Spring 2017	No changes were recommended.	No changes were implemented.	All students met or exceeded expectations.
Communicate effectively in writing and orally	Spring 2017	No changes were recommended.	No changes were implemented.	All students met or exceeded expectations.

Comments on part II:

This year the program was reviewed. The recommendation of the CAP Board was to place the Railroad Engineering emphasis on hold and to increase the number of program graduates.

Exit interview questions were redesigned to better capture the geographic information about our students.

Assessment Rubrics

MSE

Analyze and/or design a mechatronic system

	Exceeds expectations 5%	Meets expectations 75%	Does not meet expectations 20%
Design Strategy	Develops a design strategy, including a plan; decomposes work into subtasks, and develops a timetable.	Uses a design strategy with guidance.	No design strategy is attempted.
Solutions	Develops several potential designs and based on the analysis of those designs finds an optimal design solution using the system view approach.	Can develop and compare multiple solutions to a mechatronic design problem, but does not usually arrive at the best result; conducts optimization but neglects one or two key aspects. Does not use the system view approach.	Cannot design a mechatronic system or individual component without a significant amount of help. Only focuses on one solution to a problem; no optimization attempted.
Tools	Uses computer tools and engineering resources effectively to analyze and/or design mechatronic systems.	There is evidence of mostly correct use of computer tools and engineering resources.	There is no evidence of use of computer tools and engineering resources.

Apply advanced engineering principles in the design and analysis of a system or process to meet specified needs

	Exceeds expectations 5%	Meets expectations 75%	Does not meet expectations 20%
Design Strategy	Develops a design strategy, including a plan; decomposes work into subtasks, and develops a timetable.	Uses a design strategy with guidance.	No design strategy is attempted.
Constraints	Develops a solution that includes all realistic constraints.	Develops a solution that fails to include one or more minor realistic constraints.	There is no consideration of realistic constraints.

Communicate effectively in written form

	Exceeds expectations 5%	Meets expectations 75%	Does not meet expectations 20%
Articulation	Articulates ideas clearly and concisely using visual aids where appropriate.	Articulates ideas, but the idea flow is somewhat disjointed. Does not always use visual aids appropriately (e.g. a table and a graph representing the same information are used; a figure is not addressed in the narrative).	Does not develop/articulate ideas well. Makes points that are hard to understand. Does not use visual aids.
Organization	Organizes the material in a logical sequence (paragraphs, subheading, etc.).	In general, organizes the material well; however, occasionally paragraphs combine multiple thoughts. Does not identify sections and sub-sections clearly.	Imposes little or no structure or organization; does not use subheadings or proper paragraph structure.
Neatness	Presents material neatly and professionally.	Occasionally, does not present material neatly.	Does not present material neatly.
Grammar and Spelling	Uses grammar and spelling correctly.	Makes one or two spelling/grammar errors per page.	Makes spelling/grammar errors throughout more than 1/3 of the paper.
Writing Style	Uses professional writing style.	Sometimes uses jargon, improper voice, improper tense, inappropriate style, etc.	Uses inappropriate writing style for the audience and for the assignment.
Document Formatting	Conforms to the prescribed format.	Conforms to the prescribed format in many portions of the assignment.	Does not follow the prescribed format.

Communicate effectively in oral form

	Exceeds expectations 5%	Meets expectations 75%	Does not meet expectations 20%
Delivery	Plans and delivers an oral presentation effectively; applies the principle of "tell them."	Presents key elements of an oral presentation adequately, but does not apply "tell them" clearly.	Organizes the presentation poorly (e.g. no clear introduction or summary is delivered).
Length and Detail	Presents technical content appropriate for the time allowed and the audience level.	Presents excessive or insufficient detail for time allowed and/or the audience level.	Presents for an inappropriately short or long time period; omits key results during the presentation.
Mechanics	Makes eye contact; can be easily heard; speaks comfortably with minimal prompts; does not block the screen; doesn't show any distracting habits.	Exhibits minor difficulties (e.g. makes sporadic eye contact; occasionally is difficult to hear or understand; overuses prompts or does not use prompts enough; occasionally stumbles or loses place; occasionally blocks the screen; occasionally exhibits some distracting habits (um, ah, clicking pointer, etc.)).	Exhibits major difficulties with the presentation (e.g. makes no eye contact; is difficult to hear or understand; reads from prepared script; blocks the screen; exhibits distracting habits (um, ah, clicking pointer, etc.)).
Dialect	Uses proper American English.	Occasionally uses an inappropriate style of English-too conversational; uses understandable English.	Uses poor English and/or poor pronunciation.
Visual Aides	Uses visual aides effectively.	Presents visual aides that have minor errors or are not always clearly visible.	Presents multiple slides that are unclear or incomprehensible.
Appearance	Exhibits professional appearance.	Appears too casual for a professional presentation.	Appears inappropriately dressed for the occasion (e.g. wears shorts, sandals, etc.)
Listening and Response to Questions	Listens carefully and responds to questions appropriately; is able to explain and interpret results for various audiences and purposes.	Sometimes misunderstands questions; does not respond appropriately to the audience, or has some trouble answering questions.	Does not listen carefully to questions; does not provide appropriate answers, or is unable to answer questions about the presentation material.

Sample MSE Exit Interview

Name: _____ E-mail after graduation _____ Date: _____

How did you hear about our MSE program?

What other schools and/or degrees did you consider?

What could be done to make the MSE Program at CSU-Pueblo more attractive to potential students in the same circumstance you were when you began?

How was the experience of being a new (International) MSE student?

What do you think of the degree and education you received at CSU-Pueblo?

What are your future plans?

How do you feel your degree and education have prepared you for your intended career?

How do you feel that your education could have been improved?

What's the worst thing that happened to you since you got here?

What's the best thing that happened to you since you got here?

How confident are you in analyzing and/or designing mechatronic systems using appropriate engineering tools?

How confident are you in applying advanced engineering principles in analyzing and/or designing systems or processes to meet specified needs?

Could you provide any suggestions for changes in the program?