

Program: MSE

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Completed by: N. Jaksic

Assessment contributors (other faculty involved in this program's assessment): Drs. DePalma, Yuan, Paudel, Sarper, Fraser, and Bedoya-Valencia

**I. Program student learning outcomes (SLOs) assessed in this cycle, processes, results, and recommendations.**

A. Which of the program SLOs were assessed during this cycle? <b>Please include the outcome(s) verbatim from the assessment plan.</b>	B. When was this SLO last assessed?	C. What method was used for assessing the SLO? <b>Please include a copy of any rubrics used in the assessment process.</b>	D. Who was assessed? Please fully describe the student group.	E. What is the expected achievement level and how many students should be at it?	F. What were the results of the assessment?	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 mechatronic system	May 2014	<b>Methods:</b> EN 562 Final Course Exam and/or Project Reports <b>Rubrics:</b> Design Strategy, Solutions, and Tools	Four (4) MSE first year graduate students and one undergraduate senior who were enrolled in Spring 2014	80% or more of the students should meet or exceed expectations	100% of students were able to analyze and/or design a mechatronic system. Student designs demonstrated correct design strategies (Final), solutions	Students performed well. However, again, there were too few students for a valid statistical analysis.	No changes to the program are planned at this time since this is the second offering of courses in this program.

					<p>(Final), and the use of computer tools like MATLAB (Projects).</p> <p>Again, exit interviews were not administered since there were no program graduates.</p>		
Apply advanced engineering principles in the design and analysis of a system or process to meet specified needs	May 2014	<p><b>Methods:</b> EN 560 Final and/or Homework, EN 513 Final, Homework, and/or Project Reports</p> <p><b>Rubrics:</b> Design Strategy and Constraints</p>	<p>In EN 560 there were two MSE first year graduate students who were enrolled in Fall 2013.</p> <p>In EN 513 there were 4 graduate students (1 MSISE and 3 MSE) who were enrolled in</p>	80% or more of the students should meet or exceed expectations	100% of the students in EN 560 were able to apply correct state-space design strategy under given constraints and demonstrate their knowledge when solving complicated control problems.	<p>All students (100%) in EN 560 and EN 513 performed well.</p> <p>However, no firm conclusions could be reached due to small sample size.</p>	No changes to the program are planned at this time since this is the second offering of courses in this program.

			Spring 2014.		100% of the students in EN 513 were able to apply advanced engineering principles in the design and analysis of a system to meet specified needs. This was assessed by a specific project where they had to write software to find a route from a specified city in Romania to another specified city.		
Communicate effectively in writing and orally.	May 2014	<b>Methods:</b> EN 593: Paper Evaluation and/or Presentation Evaluation EN 507: Presentation Evaluation	Five (5) MSE first-year graduate students who were enrolled in EN 593 and 4 graduate students (1	80% or more of the students should meet or exceed expectations	Students in EN 593 wrote proposals for potential thesis topics. All five MSE graduate students (100%) met	100% of students met or exceeded expectations for this SLO.  Again, due to the small sample size no meaningful analysis of the	Short student satisfaction surveys will be developed and administered.

		and/or Project report evaluation <b>Rubrics:</b> <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	MSISE and 3 MSE) who were enrolled in EN 507 (fall 2013)		and/or exceeded the expectation for this SLO.  In EN 507, all 4 students (100%) met or exceeded the expectation for the paper presentation. Students in EN 507 wrote and presented a project report on a virtual reality topic.  Student surveys were not administered.	assessment results could be performed.	
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Comments: The assessment report includes only MSE-Mechatronics . The first set of courses in MSE-Railroad Engineering were offered in Fall 2013, so they are not assessed here.

**B. Follow-up (closing the loop) on results and activities from previous assessment cycles. In this section, please describe actions taken during this cycle that were based on, or implemented to address, the results of assessment from previous cycles.**

A. What SLO(s) did you address? Please include the outcome(s) verbatim from the assessment plan.	B. When was this SLO last assessed?	C. What were the recommendations for change from the previous assessment?	D. Were the recommendations for change acted upon? If not, why?	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	May 2013	<p>No changes to the program are planned at this time since this is the first offering of courses in this program.</p> <p>The rubrics will need to be improved to reflect the “analyze” portion of this SLO. In rubric “Tools,” the first cell, at the end of the sentence we will add “to analyze and/or design mechatronic systems.”</p> <p>Exit interviews will be further developed and administered to expected program graduates.</p>	<p>Yes. The rubrics are updated as planned.</p> <p>Exit interviews were developed, however, they were not administered since there were no graduates.</p>	<p>Updated rubric was more precise and thus more effective.</p> <p>As learned from the MSISE program, exit interviews are under review – we may need to make them mandatory.</p>
Apply advanced engineering principles in the design and analysis of a system or process to meet specified needs	May 2013	<p>No changes to the program are planned at this time since this is the first offering of courses in this program.</p> <p>Exit interviews will be further developed and administered to expected program graduates.</p>	Exit interviews were developed.	Since exit interviews were not administered due to lack of graduates, the review of results is postponed for the next year.
Communicate	May 2013	Effective communication	Yes.	Since the developed rubrics seem to be

effectively in writing and orally		<p>rubrics will be disseminated to students.</p> <p>We will make sure that paper and presentation evaluations are done with strict adherence to all components of this rubric.</p> <p>Student surveys will be developed and administered.</p>	<p>Communication rubrics were developed and disseminated.</p> <p>Work was graded with strict adherence to the developed rubrics.</p> <p>In one class (EN 593) an informal critique session of student work was conducted instead of using student surveys.</p>	<p>well suited for the program, the development of a course-specific survey was abandoned. Instead, a general student satisfactory survey dealing with this SLO will be considered.</p>
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Comments: There was only one year of previous assessment data with only a small sample of students, thus the results are not statistically significant and/or reliable.

# Assessment Rubrics

## MSE Mechatronics Emphasis

### Analyze and/or design a mechatronic system

	Exceeds expectations 5%	Meets expectations 75%	Does not meet expectations 20%
<b>Design Strategy</b>	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.
<b>Solutions</b>	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.
<b>Tools</b>	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%
<b>Design Strategy</b>	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.
<b>Constraints</b>	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%
<b>Articulation</b>	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.
<b>Organization</b>	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.
<b>Neatness</b>	Presents material neatly and professionally.	Occasionally, does not present material neatly.	Does not present material neatly.
<b>Grammar and Spelling</b>	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.
<b>Writing Style</b>	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.
<b>Document Formatting</b>	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%
<b>Delivery</b>	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).
<b>Length and Detail</b>	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.
<b>Mechanics</b>	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.)).
<b>Dialect</b>	Uses proper American English.	Occasionally uses an inappropriate style of English-too conversational; uses understandable English.	Uses poor English and/or poor pronunciation.
<b>Visual Aides</b>	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.
<b>Appearance</b>	Exhibits professional appearance.	Appears too casual for a professional presentation.	Appears inappropriately dressed for the occasion (e.g. wears shorts, sandals, etc.)
<b>Listening and Response to Questions</b>	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: xxxxx xxxxxx

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?*

*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?*