

Mechatronic Engineering
Annual Program Improvement Report
2011-2012

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1. INTRODUCTION

The ***Mechatronic Engineering Program Improvement Plan, edition 2*** (October 23, 2008) documents the educational objectives, outcomes, and progress to make improvements to the program.

This document, the ***Mechatronic Engineering Annual Program Improvement Report***, provides a summary of findings and actions for the 2011-2012 academic year resulting primarily from the implementations of the ***Mechatronic Engineering Program Improvement Plan***. This report is divided into three main sections: actions taken in 2011-2012 to improve the program, assessment data gathered in 2011-2012, and recommendations for improvements to the Program based on the assessment results. While some detailed data are reported here, more complete data can be found in the assessment files in the file cabinet located in the Department storeroom (OCNL 436A) and in MMEM Department folder on the Chico State Bay server.

2. ACTIONS TAKEN IN 2011-2012 TO IMPROVE THE PROGRAM

2.1 Areas Recommended for Improvement in 2010-2011 Annual Report

The 2010-2011 Annual Program Improvement Report identified four areas to consider for improvements. These areas are faculty performance, courses, program outcome assessment, and degree progress report. Actions taken for program improvement during 2011-2012 in the recommended areas are described in the following.

2.1.1 Faculty

The primary concerns expressed by graduating seniors in 2010-2011 were directed toward certain faculty members in the Computer Science (CSCI) and Electrical & Computer Engineering (EECE) departments. Brief conversation was made between the MMEM and CSCI and EECE department chairs regarding the dissatisfaction as suggested in the 2010-2011 report.

There are still some concerns about instructional quality in general in the 2012 graduating senior survey, but none were specifically directed to CSCI and EECE.

2.1.2 Courses

EECE 337 Embedded Systems Design

The EECE 337 had replaced CSCI 221 and EECE 221 as a lower-division course for Electrical Engineering and Computer Engineering majors. Since it was a required course, the Mechatronic Engineering curriculum followed the change and also had it listed as a sophomore level course. The 300-level course number,

however, created a problem for unit count - it cannot be counted and listed as a lower-division major course requirement in university catalog.

During a brief discussion regarding the course number, the Chair of the EECE department expressed an intention to re-number the course to 200-level to better reflect its content level.

Course Content and Grading

Students expressed concerns about the outdated course content, lab equipment, and inconsistent grading in the 2011 graduating senior survey. It was suggested in the 2010-2011 Improvement Report that the MMEM department should bring the concerns to EECE department's attention.

There are still complaints about courses being outdated in the spring 2012 senior survey, but none are specifically about EECE courses. There is also appreciation of the recent equipment upgrade in EECE 344 (Digital Systems Design).

2.1.3 Program Outcome Assessment

CIVL 495 for Program Outcome Assessment

The course outcome assessment data from CIVL 495 (Professional Issues in Engineering) was either unusable or only partially made available to the MMEM department in the past two years. It was suggested that the MMEM department should seek help of the Associate Dean or the Dean to obtain the data.

Through the Associated Dean, only data for CIVL 495 taught in fall 2011 was made available for the 2011-2012 report.

EECE 343 for Program Outcome Assessment

The EECE 343 (Computer Interface Circuits) was removed from the Mechatronic Engineering curriculum starting in 2011-2012. The course, however, was still listed as course with embedded program outcome *k* assessment. The 2010-2011 report suggested an option of using only MECA 380 (Measurements and Instrumentation) for Program Outcome *k* assessment. In 2010-2011 and 2011-2012 Program Improvement Reports, the Program Outcome *k* was measured only in MECA 380.

2.1.4 Degree Progress Report

As a result of the MECA curriculum revision and the consolidation of CSCI and EECE courses, the CSCI 221, at one time, has replaced the required EECE 221 which later was replaced with EECE 337. MECA students are required to take one of the EECE 221, CSCI 221, and EECE 337, depending on the Major Academic Plan (MAP) version, for Assembly language programming. The university Degree Progress Report (DPR), however, did not reflect all the revisions. In particular,

EECE 221 is not listed as one of the 17 required lower-division courses in the DPR for some students. This has created confusion not only for MECA students and advisors but also for evaluators in the Evaluations Office.

The MMEM department had requested, but the Evaluations Office did not agree to re-program the DPR. As a remedy, the MECA advisors and the department Chair have been forwarding requests for correction for each involved case to the Evaluation Office – a time-wasting practice.

3. ASSESSMENT DATA GATHERED IN 2010-2011

3.1 Embedded Assessment of Program Outcomes

Methods and results of Program Outcome assessment embedded in selected courses are summarized in Table A. As in the past, students not demonstrating basic competency in a measured outcome received an F or I (incomplete) for the course. For an incomplete to be changed to a grade other than an F, basic competency is needed to be demonstrated in the specified Program Outcome. Note that in most courses some students received an F or I because basic competency was not demonstrated by the conclusion of the course. A complete list of identified program outcomes can be found in Appendix A. Sample Program Outcome assessment record sheet can be found in Appendix B. The Table A is not complete due to the lack of assessment data from CIVL 495 taught in spring 2012.

Table A: Results of embedded Program Outcome Assessment instruments and results for 2011-12.

Program Outcome	Course	Assessment Instrument	Demonstration of basic competency above a minimum grade or score	Number of MECA majors failing to demonstrate basic competency / Number of MECA majors enrolled in class	
				Fall 2011	Spring 2012
a	MECH 340	Quizzes ($\times 8$), final exam	Average of C- or better	not taught	0/20
b ₁	MECA 440B	Individual written test plan	Pass/fail assessment	not taught	0/27
b ₂	MECA 380	Lab assignment	C- (1.7/4.0) or better	not taught	9/22
c	MECA 486	Design projects ($\times 3$)	Average B- or better	0/25	not taught
d	CIVL 495	Projects, instructor observation	70% or better	0/7	No Data
	MECA 440A	Individual in group project	Faculty advisor & peer evaluation	0/27	not taught
e ₁	MECA 440A	Individual assignment	Pass/fail grading	0/27	not taught
e ₂	MECA 482	Quizzes ($\times 3$) on system design	Average of C- or better	1/30	not taught
f	CIVL 495	Presentation, memorandums	Score 7 or better out of 10	0/7	No Data
g ₁	MECA 440A	Individual final design review	Pass/fail assessment	0/27	not taught
g ₂	MECH 340	Individual design project memo	Average of C- or better	not taught	8/20
g ₃	MECH 340	Design project drawings	Average of C- or better	not taught	4/20
h	CIVL 495	Reports, instructor observation	Score 7 or better out of 10	0/7	No Data
i	CIVL 495	Projects, presentations	Score 7 or better out of 10	0/7	No Data
j	CIVL 495	Reports, instructor observation	Score 7 or better out of 10	0/7	No Data
k	EECE 343	<i>not required</i>	<i>not required</i>	<i>not required</i>	<i>not required</i>
	MECA 380	Programming assignment	12/20 or better	not taught	1/22

Some higher rates of failures were reported in the outcome assessments embedded in MECH 340 and MECA 380. Some of the reported assessment failures have been later revised after make-up assessment tests or assignments were satisfactorily completed.

3.2 Graduating Senior Survey

In spring 2012 an anonymous online survey of Mechatronic Engineering majors enrolled in MECA 440B was conducted. The survey questions are reproduced in Appendices C and D. Responses of all Mechatronic Engineering majors are documented in the College of Engineering, Computer Science, and Construction Management assessment report – ECC Senior Exit Survey Results, AY 2011-2012. The survey questions can be grouped into those relating to (1) demographics and post-graduate plans (which will not be discussed further in this report), (2) educational satisfaction, (3) Program Outcomes, (4) project management skills, and (5) other outcomes.

3.2.1 Educational Satisfaction

Survey results for questions relating to educational satisfaction from surveys conducted 2006 to 2012 are tabulated in Table B, and changes from 2011 to 2012 are summarized in Figure 1.

Table B: Means of responses to survey questions regarding educational satisfaction in the spring 2012 graduating senior survey.

(5 level Likert scale: 1 = very dissatisfied and 5 = very satisfied; for question 44 only, 1 = strongly disagree and 5 = strongly agree.)

No.	At Chico State, how satisfied were you with the ...	2006	2007	2008	2009	2010	2011	2012
15	Quality of teaching by faculty in your department	3.63	3.54	3.75	3.75	3.70	3.65	3.96
16	Quality of teaching by other faculty	3.19	3.38	3.75	3.63	3.60	3.60	3.59
17	Access to faculty in your department	4.38	4.00	3.88	4.19	4.10	4.30	4.15
18	Availability of courses in your department	4.00	4.08	3.25	2.81	3.13	3.50	3.56
19	Quality of courses in your department	3.69	3.69	3.50	3.69	3.62	3.80	3.81
20	Access to lab facilities and equipment	3.94	3.62	3.50	3.75	3.38	4.20	4.15
21	Quality of laboratories and equipment	3.63	2.69	3.00	3.25	3.35	3.60	3.78
22	Access to computer facilities	4.25	4.00	4.38	4.13	3.87	4.15	4.07
23	Quality of computer facilities	3.56	3.38	3.88	3.41	3.30	3.55	3.30
24	Academic advising from your major advisor	3.00	3.17	3.38	3.84	3.60	3.90	3.56
25	Academic advising from the Advising Office	2.86	2.85	2.88	3.13	3.32	3.60	3.42
26	Career information from your department	2.88	3.38	3.13	2.77	2.80	3.40	3.37
27	Availability of GE courses	4.13	3.54	3.63	3.69	3.65	3.50	3.52
28	Quality of GE courses	3.56	3.00	3.25	3.13	3.20	3.11	3.19
29	Overall quality of your education	3.94	3.85	3.63	3.88	3.90	3.90	4.00
30	Your overall experience at Chico State	4.13	4.23	3.75	4.16	4.20	3.95	4.30
44	I would recommend my major at CSU, Chico to others	4.07	4.08	3.50	4.22	4.08	4.20	4.48

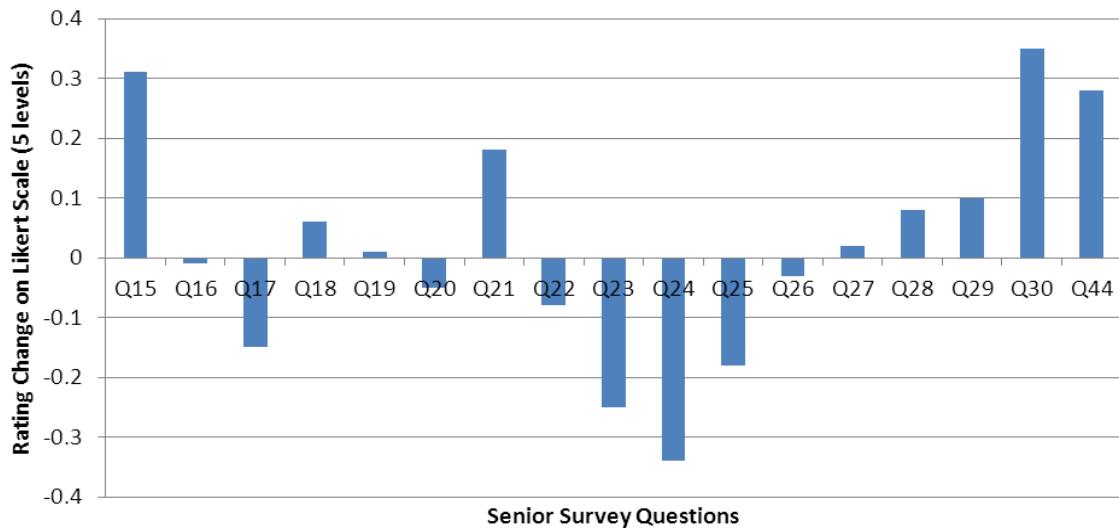


Figure 1: Changes of responses to survey questions regarding educational satisfaction from 2011 to 2012.

According to Figure 1, questions directly related to educational satisfaction in the spring 2012 survey had mixed results comparing with those from 2011 survey.

The most significant negative changes are in “*Quality of computer facilities (Q23)*”, “*Academic advising from your major advisor (Q24)*”, and “*Academic advising from the Advising Office (Q25)*”.

On the other hand, students appreciate the quality of teaching by MMEM faculty and their overall experience at Chico State (Q15 and Q30). The graduating seniors would also be more inclined to recommend the MECA major at CSU, Chico to others (Q44). The ratings of the three areas with the greatest improvements (Q15, Q30, and Q44) actually are the highest in respective survey area since 2006.

3.2.2 Program Outcomes

Responses to survey questions relating to Program Outcomes, except Question No. 42, from 2006 to 2012 and changes from 2011 to 2012 are summarized in Table C and Figure 2, respectively.

In spring 2012, the Mechatronic Engineering specific questionnaire was revised for a broader scope of outcome assessment. Some of the new survey questions are very close to previous ones (S2, S5, S10, S11), making a comparison of survey results between 2011 and 2012 possible (Table C). Other new questions have data collected the first time in 2012.

Table C: Mean of responses to survey questions regarding Program Outcomes in the spring 2012 graduating senior survey. (5 level Likert scale: 1 = very unprepared and 5 = very well prepared)

No.	Based on your educational experience here at Chico State, how well prepared are you to ...	2006	2007	2008	2009	2010	2011	2012
31	Apply knowledge of math, science, engineering, or technology to solve problems	4.06	4.23	4.13	4.13	4.15	4.30	4.44
32	Design and conduct experiments	3.81	3.92	4.13	3.69	4.05	4.10	4.37
33	Analyze and interpret data	3.69	3.92	4.13	4.03	4.05	4.20	4.37
34	Design a component or system to meet desired needs	3.88	4.08	4.00	4.31	3.95	4.05	4.37
35	Function on a multidisciplinary team	4.63	4.38	4.13	4.28	4.30	4.25	4.41
36	Identify, formulate, and solve technical problems	4.00	4.23	4.00	4.31	4.20	4.25	4.52
37	Communicate technical matters in writing	3.88	3.77	4.13	3.94	3.80	3.50	4.26
38	Communicate technical matters orally	4.06	4.23	4.13	3.94	4.05	3.70	4.33
39	Understand & apply professional & ethical principles	4.25	3.85	4.13	4.35	3.80	3.85	4.30
40	Understand contemporary issues facing society	3.69	3.46	4.13	3.84	3.70	3.55	4.07
41	Use modern tools and technology	3.69	3.69	3.63	4.03	3.80	3.80	4.26
42	Enter the workplace (I)	3.50	4.15	4.25	3.90	3.65	3.95	4.15
43	Continue learning	4.13	4.23	4.25	4.25	4.10	4.47	4.59
S1	Write verifiable engineering specifications based on customer needs	<i>not surveyed</i>						4.52
S2	Produce a set of dimensioned engineering drawings	3.38	3.50	4.50	<i>no data</i>	4.00	3.85	4.19
S3	Produce a circuit diagram for a printed circuit board	<i>not surveyed</i>						3.93
S4	Produce a wiring diagram for a particular design	<i>not surveyed</i>						4.37
S5	Communicate manufacturing needs to a technician	3.88	3.80	4.00	<i>no data</i>	3.30	4.00	4.11
S9	Integrate mechanical, electronics, and computing into a subsystem	<i>not surveyed</i>						4.52
S10	Present information for design review	4.38	4.10	4.38	<i>no data</i>	3.95	4.16	4.44
S11	Prepare and execute an experimental test plan	4.19	3.60	4.38	<i>no data</i>	3.95	4.20	4.44
S12	Select hardware and develop software for automated data acquisition	<i>not surveyed</i>						4.30
S13	Select a material for a specific application	<i>not surveyed</i>						4.15
S14	Solve equations using numerical techniques	<i>not surveyed</i>						4.39
S15	Simulate or write equations of the performance of a system	<i>not surveyed</i>						4.19
S16	Select machine parts and lubrication for a particular application	<i>not surveyed</i>						3.89
S17	Select a motor for a particular application	<i>not surveyed</i>						4.56

(I) Question number 42 is not a defined Program Outcome

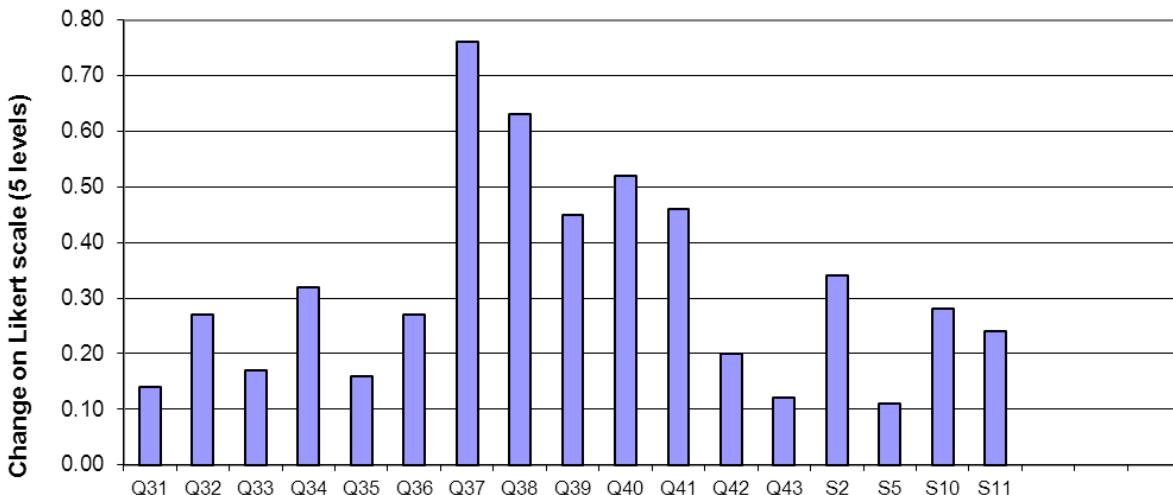


Figure 2: Changes of responses to survey questions regarding Program Outcomes from 2011 to 2012

It is very encouraging that rating improvement is observed (Figure 2) in every survey area where comparison can be made between 2011 and 2012. The biggest improvements are in the writing and oral communication of technical matters (Q37 and Q38).

It should also be noted that the 2012 graduates are very confident in *Identifying, formulating, and solving technical problems* (Q36 with 4.52/5.00 rating), *Writing verifiable engineering specifications based on customer needs* (S1 with 4.52/5.00 rating), *Integrating mechanical, electronics, and computing into a subsystem* (S9 with 4.52/5.00 rating), and *Selecting a motor for a particular application* (S17 with 4.56/5.00 rating).

3.2.3 Management Skills

Survey results of questions regarding management skills from 2006 to 2012 are summarized in Table D. The question numbers (S6, S7, and S8) are those of the revised supplemental questions (see Appendix D). These questions, however, are very close to those prior to the 2012 survey, making continuous comparisons possible.

Table D: Mean of responses to survey questions relating to project management skills in the spring 2012 graduating senior survey. (5 level Likert scale: 1 = very unprepared and 5 = very well prepared)

No.	Based on your educational experience here at Chico State, how well prepared are you to ...	2006	2007	2008	2009	2010	2011	2012
S6	Create a Gantt chart for a project	3.25	3.50	3.75	no data	3.89	3.70	4.22
S7	Identify the critical path for a project			no data	no data	4.00	3.95	4.22
S8	Develop a detailed project budget	3.75	3.30	4.50	no data	3.70	4.10	4.11

In comparison, the 2012 graduating seniors are more confident than 2011 graduates about project management skills as all three surveyed areas have improved ratings as indicated in Table D.

3.2.4 Open-ended Written Comments

Parts of written responses to the open-ended question “please provide additional comments that will help faculty to improve the quality of the education they provide” in the MECA supplemental questions are categorized and summarized in the following. The comments presented here are direct quotes, including possible spelling and grammatical errors.

Curriculum and Courses

- “Assembly language programming and computer interface circuits would be much more valuable if they were taught by more competent professors.”
- “Overall, I would have liked to see more mechatronics related classes in automation, controller integration and robotics.”
- “I would like to see the material covered in MECA 486 is expanded and placed over two semesters.”
- “I also noticed that in the new mechatronics MAP that a second semester of SolidWorks is now required. I believe that is a great idea …”
- “… include more SMFG classes into the program …”
- “we spend all this time learning LabView which is great but a lot of us who will be application engineers still have no idea how to program an Allen Bradley PLC.”
- “A few courses felt like they really should have a lab, like Control Systems.”
- “… I benefited quite a lot from semester-long projects since they were more involved and more in-depth.”
- “Most of the general education classes seem to simply repeat what was already taught in high school, and could be replaced by engineering classes.”
- “I however believe that the education I have earned here at CSU Chico is second to none. The projects and lessons I have learned along the way set me above the other engineering students I have talked with.”
- “MECH 140 was extremely interesting and a great way to figure out if Mechatronics is the program for you.”

Faculty

- “There are professors in the College of Engineering that need to be replaced. They have been here too long and care far too little about the students of this college.”
- “Don’t be afraid to hire younger ambitious professors that are willing to the good foundation you and your predecessors have built and run with it!”
- “Just be passionate and excited about the topic being taught. Know the material and be available for office hours.”
- “The current mechatronics program needs to be restructured with professors that are willing to teach and still have relevant information to teach.”

Capstone Project

- “Please set a hard deadline for corporate sponsors to submit their required monetary contribution, as our group did not appreciate the two-month delay when our sponsor decided to ignore requests for project funding.”
- “... make it extremely clear at the beginning of the semester how much of the money will be available for direct parts purchases, and exactly what procedure is required for reimbursement.”
- “A few courses felt like they really should have a lab, like Control Systems.”

Lab Experience

- “..., the computers in the engineering labs are slow and unproductive in some cases.”
- “... those of us who need access to lab equipment must wait until late at night (usually after 8 pm) or the weekend to get access to the equipment again.”

Support

- “I love the helpfulness of most of the instructors in the MMEM department and the down-to-earth attitudes and understanding ...”
- “I also found the staff very helpful and cheerful to do so when trying to promote/plan a club event (AIME).”

3.3 Student Evaluation of Teaching (SET)

Mechatronic Engineering students take courses taught by the MMEM department as well as those by other academic departments. Besides the optional SET in fall semesters, the mandatory SET is conducted in all classes containing lecture component in spring semesters. In spring 2012 the department adopted a new SET instrument, SIR II, which is more comprehensive comparing with the one used in the years past. The SIR II questionnaire contains ten categories that each comes with related questions. The ten sets of questions can be found in Appendix E.

Here the rating means for seven of the ten question sets for MECH and MECA courses in the spring 2012 SET are summarized in Figure 6. The remaining three question sets did not generate meaningful data and department means for evaluation purpose. Rating distribution for each of the seven categories is also collected in Appendix F.

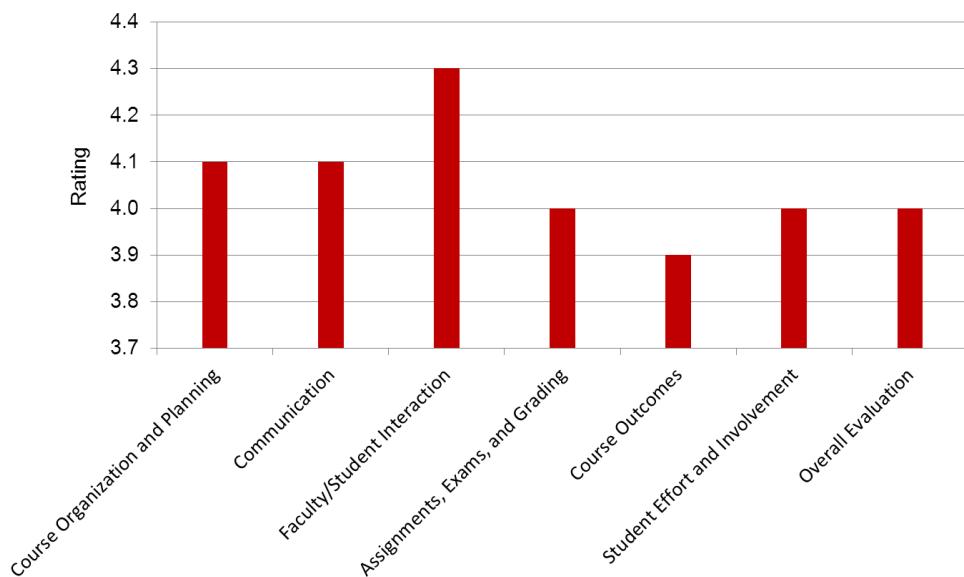


Figure 6 – Rating means for seven surveyed categories in MECH and MECA courses from spring 2012 SET. The rating scale is 1 to 5 with 5 being the most effective.

As can be seen in Figure 6, most evaluated categories received ratings around or above 4.0 on a scale of 1 to 5 with 5 being most effective. The highest rating is for the interaction between faculty and students – a tradition the department is well known for.

Of the seven reported evaluation categories, the ratings for *Student Effort and Involvement* has the narrowest distribution (Figure 7a) while the *Overall Evaluation* has the widest distribution ranging from 2.4 to 4.8 (Figure 7c). The wide distribution of ratings for *Course Outcomes* (Figure 7b) and *Overall Evaluation* (Figure 7c) points to an undesirably large variation in instructional skills and effectiveness of faculty.

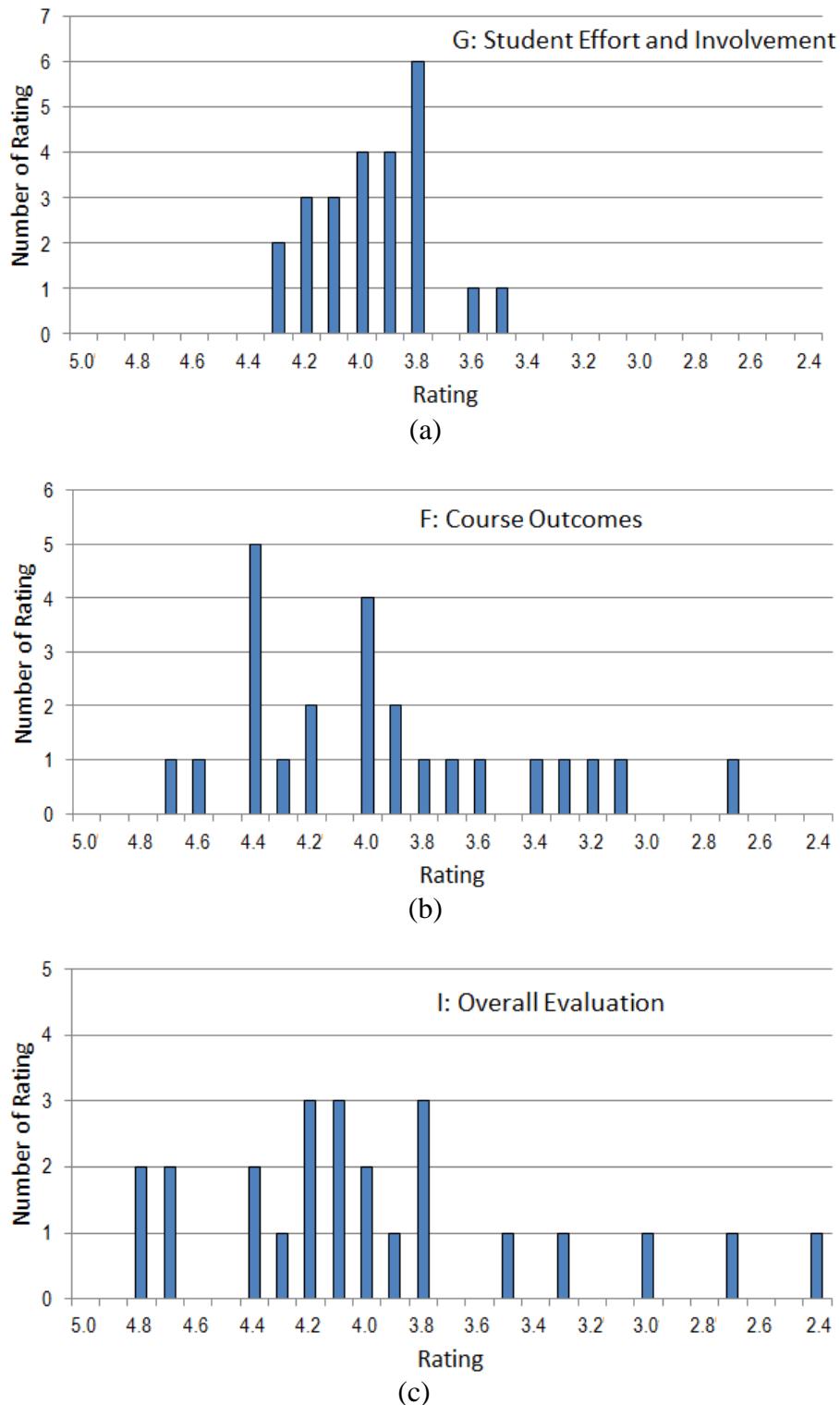


Figure 7 – Distribution of ratings for three categories of the spring 2012 SET

4. Recommendations for Program Improvement

4.1 Faculty

Several written comments in the 2012 graduating senior survey were fairly critical of the large variation of faculty teaching skills and effectiveness. The comments were also supported by the wide distribution curve of ratings in the *Course Outcomes* and *Overall Evaluation* categories of the spring 2012 SET. It is important that all faculty members should be conscientious about the instruction-related practice.

4.2 Courses

4.2.1 EECE 337

The EECE 337 (Embedded Systems Design) has replaced CSCI 221 and EECE 221 as a required sophomore level class for Mechatronic Engineering starting in 2012-2013. It is also taken by Electrical Engineering and Computer Engineering majors in sophomore year. As a 300-level course, EECE 337 cannot be listed as a required lower-division course in the university catalog and Degree Progress Report. The MMEM department should continue to pursue with EECE department the possibility of changing its course number to 200-level.

4.2.2 Course Contents

There was dissatisfaction about instruction and contents of technical courses taught by engineering faculty. Without naming courses, the comments are fairly general about outdated course content. The MMEM department may try to find out if any MECH or MECA courses are included and, if so, evaluate their course contents.

4.3 Labs

4.3.1 Lab experience

As stated in the student written comments in the graduating senior survey, lab exercises can serve to enhance learning. Lab or activity component was removed from a number of courses in the previous run of unit reduction. If possible, faculty may consider adding or restoring lab component in courses that include *Control System Design* (MECA 482).

4.3.2 Lab and equipment upgrade

It has been known for quite some time that the department's labs and equipment are gradually outdated. Students also frequently expressed dissatisfaction about the situation. It is a very challenging task to upgrade lab facility and equipment in the current and future state of diminishing state funding. The department and faculty will need to be more creative in locating resources for equipment upgrade.

4.4 Program Outcome Assessment

4.4.1 CIVL 495 for Program Outcome Assessment

The course outcome assessment data from CIVL 495 (Professional Issues in Engineering) continues to be a missing major piece for completing the Mechanical Engineering program outcome assessments. For two years, the data was either not available (2010-2011) or only partially available (fall 2011) to the MMEM department. Since five of the Program Outcomes are assessed in CIVL 495, the voids left in the outcome assessments may adversely affect in the next round of ABET accreditation. As the MMEM faculty tried but were unable to identify a suitable MECH course to replace CIVL 495, the department should try again request help of the Associate Dean or Dean to obtain the data for the missing semesters.

4.4.2 EECE 343 for Program Outcome Assessment

As designated in the *Mechatronic Engineering Program Improvement Plan, edition 2* (October 23, 2008), EECE 343 (Computer Interface Circuits) has been one of the two courses (the other is MECA 380 – Measurements and Instrumentation) for outcome k assessment in the last few years. With the modification of Mechatronic Engineering curriculum EECE 343 was no longer required starting in the 2011-12 Major Academic Plan. The course should be removed from the *Mechatronic Engineering Program Improvement Plan, edition 2* as a course with embedded assessment.

4.5 Degree Progress Report

As a result of the MECA curriculum revision and the consolidation of CSCI and EECE courses, the CSCI 221, at one time, has replaced the required EECE 221 which was later replaced with EECE 337. MECA students are required to take one of the EECE 221, CSCI 221, and EECE 337, depending on the MAP version, for Assembly language programming. The university Degree Progress Report (DPR), however, does not reflect all the revisions. In particular, EECE 221 is not listed as one of the 17 required lower-division courses in some DPRs. This has created confusion for not only MECA students and advisors but also Evaluators in the Evaluations Office. As the Evaluations Office is not interested in re-programming the DPR, MECA advisors should be mindful of the course missing from the list of required lower-division courses in DPR. If necessary, course substitution should be considered and requested.

Appendix A

Statement of Mechatronic Engineering Program Outcomes*

Mechatronic Engineering Program graduates must have:

- a. An ability to apply knowledge of mathematics, science, and engineering*
- b₁. An ability to design experiments to evaluate the performance of a mechatronic system or component with respect to specifications*
- b₂. An ability to conduct experiments, as well as analyze and interpret data*
- c. An ability to design a mechatronic system, component, or process to meet desired needs*
- d. An ability to function effectively as members of multidisciplinary teams*
- e₁. An ability to define engineering problems*
- e₂. An ability to solve engineering problems*
- f. An understanding of professional ethical responsibility*
- g₁. An ability to communicate technical matters effectively in oral form*
- g₂. An ability to communicate technical matters effectively in written form*
- g₃. An ability to communicate technical matters effectively in graphical form*
- h. The broad education necessary to understand the impact of engineering solutions in a global and societal context*
- i. A recognition of the need for, and an ability to engage in, life-long learning*
- j. A knowledge of contemporary issues*
- k. An ability to use the techniques, skills, and modern mechatronic engineering tools necessary for engineering practice*

* From Mechatronic Engineering Program Improvement Plan, edition 2 (October 23, 2008)

Appendix B

Sample Program Outcome Assessment Record Sheet

Mechatronic Engineering Program Outcome Record-sheet

Course:			Semester:	
Program Outcome:			Instructor:	
Description of instruments used in this course to measure attainment of program outcome:	1			
	2			
	3			
	4			
	5			
	6			
How instruments are used to measure achievement of program outcome:	1			
	2			
	3			
	4			
	5			
	6			
Number of students in class achieving program outcome:				#VALUE!
Number of students in class not achieving program outcome:				#VALUE!
Comments on the suitability of the instruments used to measure achievement the program outcome:				
Suggestions for possible changes of how achievement of the program outcome can be measured:				
Suggestions for improving the program:				
<p><i>Note: Shaded fields are to be fill-in.</i></p> <hr/>				

Appendix C

ECC Graduating Senior Survey Instrument Spring 2012

ECC Graduating Senior Survey

College of Engineering, Computer Science, and Construction Management

CSU, Chico

Dear Graduating Senior,

The College of ECC has developed this Survey to give you a forum for letting us know what you think of your experience at CSU, Chico, and to help us to continually improve the curriculum and services we offer. We care a great deal about the programs and your feedback is essential to helping us provide the highest quality education we can deliver. Thank you in advance for your time and attention to this survey.

We hope the years you have spent with us have enriched your life and provided you with the foundation for a successful career. Please stay in touch!

With best wishes, The College of ECC Faculty

1. Major:

2. Graduation Date

Semester

Spring Summer Fall

Year

2011 2012 2013 2014

3. Did you come to Chico State as a ...

First-time freshman Transfer

4. How many semesters did you attend Chico State?

1-3 4-6 7-9 10-12 13+

5. What is your Overall GPA?

Below 2.25

2.25-2.49

2.50-2.74

2.75-2.99

3.00-3.24

3.25-3.49

3.50-3.74

3.75-4.00

6. If you had an internship, co-op, or job related to your major while in school, how valuable was the experience?

Did not have internship, co-op, or job

Very Valuable

Valuable

Somewhat Valuable

Not Valuable

7. If you were involved in any student/professional society, activities, or clubs, how valuable was the experience?

Was not involved in societies, activities, or clubs

Very Valuable

Valuable

Somewhat Valuable

Not Valuable

8. Immediately after graduating are you planning to....

Attend graduate School

Yes No

Begin Working

Yes No

If you are NOT planning to work full-time, or if you have not begun looking for a job,
please skip to Question 13.

9. How many job offers have you received?

None One Two Three Four +

10. Do you currently have a job offer that you are likely to accept?

Yes

No

11. If you interviewed through the campus Career Planning & Placement Office,
how helpful was it?

Did not interview through campus office

Very Helpful

Helpful

Somewhat Helpful

Not Helpful

12. If you found a job that you are likely to accept, how did you find it?

Campus Career Planning & Placement Office

Faculty/department referral

Online Posting

Mailed resume

Personal Connections

Other

13. Did you take a comprehensive exam (FE, CMdgT, MFT or other) for your discipline?

No, did not take

Yes, and passed

Yes and did not pass

Yes and waiting for results

14. If you took a comprehensive exam, did you also attend a review course to prepare you for the exam?

Yes

No

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For Survey Content Questions,
contact Lynn Abbiati: labbiati@csuchico.edu

For Technical Questions,
contact Paul Weatherby: pweatherby@csuchico.edu

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Educational Satisfaction Questions

At Chico State, how satisfied were you with the...

	Very Dissatisfied	Very Satisfied
15. Quality of teaching by faculty in your department	<input type="radio"/>	<input type="radio"/>
16. Quality of teaching by other faculty	<input type="radio"/>	<input type="radio"/>
17. Access to faculty in your department	<input type="radio"/>	<input type="radio"/>
18. Availability of courses in your department	<input type="radio"/>	<input type="radio"/>
19. Quality of courses in your department	<input type="radio"/>	<input type="radio"/>
20. Access to laboratory facilities and equipment	<input type="radio"/>	<input type="radio"/>
21. Quality of laboratories and equipment	<input type="radio"/>	<input type="radio"/>
22. Access to computer facilities	<input type="radio"/>	<input type="radio"/>
23. Quality of computer facilities	<input type="radio"/>	<input type="radio"/>
24. Academic Advising from your major advisor	<input type="radio"/>	<input type="radio"/>
25. Academic Advising from the University Advising Office	<input type="radio"/>	<input type="radio"/>
26. Career information from your department	<input type="radio"/>	<input type="radio"/>
27. Availability of General Education courses	<input type="radio"/>	<input type="radio"/>
28. Quality of General Education courses	<input type="radio"/>	<input type="radio"/>
29. The overall quality of your education	<input type="radio"/>	<input type="radio"/>
30. Your overall experience at Chico State	<input type="radio"/>	<input type="radio"/>

Program Outcomes Questions

Based on your educational experience here at Chico State,
how well prepared are you to...

	Very Unprepared	Very Prepared
31. Apply knowledge of math, science, engineering, or technology to solve problems	<input type="radio"/>	<input type="radio"/>
32. Design and conduct experiments	<input type="radio"/>	<input type="radio"/>
33. Analyze and interpret experimental data	<input type="radio"/>	<input type="radio"/>
34. Design a component or system to meet desired needs	<input type="radio"/>	<input type="radio"/>
35. Function in a multidisciplinary team	<input type="radio"/>	<input type="radio"/>
36. Identify, formulate and solve technical problems	<input type="radio"/>	<input type="radio"/>
37. Communicate technical matters in writing	<input type="radio"/>	<input type="radio"/>
38. Communicate technical matters orally	<input type="radio"/>	<input type="radio"/>
39. Understand and apply professional and ethical principles	<input type="radio"/>	<input type="radio"/>
40. Understand contemporary issues facing society	<input type="radio"/>	<input type="radio"/>
41. Use modern tools and technology	<input type="radio"/>	<input type="radio"/>
42. Appreciate impact of your solutions on society and environment	<input type="radio"/>	<input type="radio"/>
43. Continue learning	<input type="radio"/>	<input type="radio"/>
	Strongly Disagree	Strongly Agree
44. I would recommend my major program at CSU, Chico to others.	<input type="radio"/>	<input type="radio"/>

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45. How satisfied are you with the department support you received while enrolled at Chico State?

- Very dissatisfied
- Somewhat dissatisfied
- Neutral
- Somewhat satisfied
- Very satisfied

46. How often did you meet with someone in the University Advising Office?

- More than once a semester
- Once a semester
- Once a year
- Less than once a year
- Never

47. How often did you meet with your major (departmental) advisor?

- More than once a semester
- Once a semester
- Once a year
- Less than once a year
- Never

48. How would a requirement for your major to purchase a laptop have impacted your decision to come to Chico State?

- Would not have impacted my decision to come
- Minor financial difficulty, but I would have still come
- Major financial difficulty, but I would have still come
- May have prevented me from coming
- Would have definitely prevented me from coming

49. How has the quality of your educational experience varied over the time period you were enrolled at Chico State?

- Quality improved significantly
- Quality improved somewhat
- Quality stayed fairly consistent
- Quality declined somewhat
- Quality decline considerably

50. Permanent e-mail Address (so we can keep in touch)

You Have 3500 Characters Remaining.

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Appendix D

MECA Supplemental Questions



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MECA Supplemental Questions

Based on your educational experience at Chico State,
how well prepared are you to:

1. Write verifiable engineering specifications based on customer needs
2. Produce a set of dimensioned engineering drawings
3. Produce a circuit diagram for a printed circuit board
4. Produce a wiring diagram for a particular design
5. Communicate manufacturing needs, including tolerances, to a technician
6. Create a Gantt chart for a project
7. Identify the critical path for a project
8. Develop a detailed project budget
9. Integrate mechanical, electronics, and computing into a subsystem
10. Present information for a design review
11. Prepare and execute an experimental test plan
12. Select hardware and develop software for automated data collection
13. Select a material for a specific application
14. Solve equations using numerical techniques
15. Simulate or write equations of the performance of a system
16. Select machine parts and lubrication for a particular application
17. Select a motor for a particular application
18. In the space provided, please provide additional comments that will help faculty to improve the quality of the education they provide.

You Have 3500 Characters Remaining.

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contact Lynn Abbiati: labbiati@csuchico.edu

For Technical Questions,
contact Bill Allen: ballen@csuchico.edu

Appendix E

Student Evaluation of Teaching (SET) Questions Spring 2012

STUDENT INSTRUCTIONAL REPORT



Class Report
Subunit: ECC - Mech Engr,
Mechatronic Engr, Manufact Tech
Course: Measurements and
Instrumentation
Instructor:
Enrollment:
Survey Period: Spring 2012

Assessing Courses and Instruction

PERCENTAGES reported below are based
on the total number responding, which is: 7*

A. Course Organization and Planning	Omit	Not Applicable	5 Very Effective	4 Effective	3 Moderately Effective	2 Somewhat Ineffective	1 Ineffective	Mean
1. The instructor's explanation of the course requirements								
2. The instructor's preparation for each class period								
3. The instructor's command of the subject matter								
4. The instructor's use of class time								
5. The instructor's way of summarizing or emphasizing important points in class								
Overall Mean								

B. Communication	Omit	Not Applicable	5 Very Effective	4 Effective	3 Moderately Effective	2 Somewhat Ineffective	1 Ineffective	Mean
6. The instructor's ability to make clear and understandable presentations								
7. The instructor's command of spoken English (or the language used in the course)								
8. The instructor's use of examples or illustrations to clarify course material								
9. The instructor's use of challenging questions or problems								
10. The instructor's enthusiasm for the course material								
Overall Mean								

C. Faculty/Student Interaction	Omit	Not Applicable	5 Very Effective	4 Effective	3 Moderately Effective	2 Somewhat Ineffective	1 Ineffective	Mean
11. The instructor's helpfulness and responsiveness to students								
12. The instructor's respect for students								
13. The instructor's concern for student progress								
14. The availability of extra help for this class (taking into account the size of the class)								
15. The instructor's willingness to listen to student questions and opinions								
Overall Mean								

D. Assignments, Exams, and Grading	Omit	Not Applicable	5 Very Effective	4 Effective	3 Moderately Effective	2 Somewhat Ineffective	1 Ineffective	Mean
16. The information given to students about how they would be graded								
17. The clarity of exam questions								
18. The exams' coverage of important aspects of the course								
19. The instructor's comments on assignments and exams								
20. The overall quality of the textbook(s)								
21. The helpfulness of assignments in understanding course material								
Overall Mean								

E. Instructional Methods and Materials	Omit	Not Applicable	5 Very Effective	4 Effective	3 Moderately Effective	2 Somewhat Ineffective	1 Ineffective	Mean
22. Problems or questions presented by the instructor for small group discussions								
23. Term paper(s) or project(s)								
24. Laboratory exercises for understanding important course concepts								
25. Assigned projects in which students worked together								
26. Case studies, simulations, or role playing								
27. Course journals or logs required of students								
28. Instructor's use of computers as aids in instruction								
Means are not reported (***) for Instructional Methods								

F. Course Outcomes	Omit	Not Applicable	5 Very Effective	4 Effective	3 Moderately Effective	2 Somewhat Ineffective	1 Ineffective	Mean
29. My learning increased in this course?								
30. I made progress toward achieving course objectives?								
31. My interest in the subject area has increased?								
32. This course helped me to think independently about the subject matter...								
33. This course actively involved me in what I was learning?								
Overall Mean								

G. Student Effort and Involvement	Omit	Not Applicable	5 Very Effective	4 Effective	3 Moderately Effective	2 Somewhat Ineffective	1 Ineffective	Mean
34. I studied and put effort into the course?								
35. I was prepared for each class [writing and reading assignments]?								
36. I was challenged by this course?								
Overall Mean								

H. Course Difficulty, Work Load, and Pace	Omit	Very difficult	Somewhat difficult	About right	Somewhat elementary	Very elementary
37. For my preparation and ability, the level of difficulty of this course was?						
	Omit	Much heavier	Heavier	About the same	Lighter	Much lighter
38. The workload for this course in relation to other courses of equal credit was?						
	Omit	Very fast	Somewhat fast	Just about right	Somewhat slow	Very slow
39. For me, the pace at which the instructor covered the material during the term was?						

I. Overall Evaluation	Omit	5 Very Effective	4 Effective	3 Moderately Effective	2 Somewhat Ineffective	1 Ineffective	Mean
40. Rate the quality of instruction in this course as it contributed to your learning (try to set aside your feelings about the course content):							
Overall Mean							

J. Student Information	Omit	A major/minor requirement	A college requirement	An elective	Other			
41. Which one of the following best describes this course for you?								
	Omit	Freshman/1st year	Sophomore/2nd year	Junior/3rd year	Senior/4th year	Graduate	Other	
42. What is your class level?								
	Omit	Better in English		Better in another language		Equally well in English and another language		
43. Do you communicate better in English or another language?								
	Omit	Female		Male				
44. Sex								
	Omit	A	A-	B+	B	B-	C+	Below C
45. What grade do you expect to receive in this course?								

Appendix F

Summary of Student Evaluation of Teaching (SET) Ratings Spring 2012

