Assessment: Course Four Column

SPRING / SUMMER 2016

El Camino: Course SLOs (MATH) - Pre-Engineering

ECC: ENGR 1:Intro to Engineering

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Analyze Engineering Profession - Analyze the preparation, training, practice, obligations, and ethics required in the engineering profession. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014), 2015-16 (Spring 2016) **Input Date:** 11/21/2013	**Essay/Written Assignment -** Students were asked to write a one page essay describing the preparation, training, practice, obligations, and ethics required in the engineering profession. **Standard and Target for Success:** The rubric was based on a 4 point scale with the lowest being 0, corresponding to No Understanding, 1 corresponding to Some Understanding, 2 corresponding to Most Understanding, and 3 corresponding to Complete Understanding. Students who earned a 2 or 3 were deemed Successful at mastering the SLO, while those scoring 0 or 1 were Unsuccessful. If a student correctly analyzed just one of the concepts listed in SLO #1, the student would earn 1 point, if the student analyzed three of the ideas listed, the student would earn 2 points, and if they analyzed all five correctly, they would earn 3 points, which is the maximum. Since the last time that		

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	students were assessed for SLO #1, which was during the Spring 2013 semester, no students earned a score of 0 or 1, 36% earned a score of 2, 64% earned a score of 3, the success rate was 100%. For this Spring 2014 semester, because the 100% success rate cannot be improved upon, the target was set for 75% of the students to earn a score of 3, corresponding to complete understanding.		
	Essay/Written Assignment - Based on this semester long project, you will write a report that will cover following aspects of engineering profession for which you are planning to study. 1. What academic preparation is required for an engineering professional planning to graduate in the area in which you are planning your engineering study? (If you have not chosen an engineering or computer science major, then you can write about academic preparation for a general engineering degree). Discuss in terms of areas of concentrations during the study program and key courses related to those areas of concentrations. Discuss as to what would be the best quality academic preparation. Read rest of the details in attached document. **Standard and Target for Success:** Grading Rubric: 1. What academic preparation is	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Table below gives score distributions. Score percentage or range Number of students in that range Percentage of Students in each range (%) 100% 1 3.6 90 % to <100% 5 17.9 80% to <90% 9 32.0 70% to <80% 7 25.0 60% to <70% 3 10.7 50% to < 60% 1 3.6 <50% 2 7.2 Total 28 100.0 The table below shows the statistics of above data: Statistical Property Value of Statistical Property Highest 100% Average 77% Median 82%	**Action:** To improve student engagement in engineering, invite El Camino Chapter of Society of Women Engineers (SWE), Society of Hispanic Professional Engineers (SHPE), El Camino ACM (American Computing Machinery) Chapter, and El Camino Robotics Club to speak to Engineering 1 class and describe avenues for professional engagement at El Camino Campus. (10/04/2018) **Action Category:** Program/College Support **Action:** Invite writing center staff to give a talk to engineering 1 student's to describe writing lab facilities available at the El Camino College Campus. (10/04/2017) **Action Category:** Program/College Support

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	required for an engineering professional planning to graduate in the area in which you are planning your engineering study? 2 points 2. What post academic training would be needed for a successful engineering career by an engineering professional planning to practice the branch of engineering of your interest? 2 points 3. Analyze and describe the typical practice day, week, and month of a practicing engineer in the area of your interest. What kinds of practice problems would such an engineer solve on daily, weekly, and monthly basis? 2 points 4. What ethical responsibilities would an engineer in your area of interest would have and how would he/she meet them? How would such an engineer resolve ethical dilemma? 2 points 5. What kinds of professional, civic, and social obligations an engineer in your area of interest would have? How would he/she meet those obligations? 2 points It is expected that SLO would be met if 70 % or more students score 70% or more in this SLO assignment.	Standard Deviation 21% Lowest 0% Percentage of Students passing (70% or above) 79% The low standard deviation in second table shows a high confidence in the average and/or median value. In fact the median being the central tendency of data is so impressive that median value did not change even after outlier datum was removed from the analysis. Using data without outliers, about 4/5th or 80% of the Engineering 1 students met the criterion for successful completion. About 1/5th of the class or more precisely 20% of the class did not meet successful completion standard. The percentage meeting successful criterion improves once outlier data are removed from the statistical analysis. Interpretation of results The graphical presentation of student SLO scores shows a skewed bi-modal distribution. However, if two outliers are removed, then data seems to have a good quality Gaussian distribution, with central tendency around 85% score. We are establishing a success criterion in engineering courses, that if 70% of students achieve 70% or higher in SLO tests, then goal of SLO has been met. The following reasons can be cited for the underperformance (be it not passing, or barely passing). 1. Poor quality writing skills. 2. Poor quality or inadequate research skills. 3. Poor communication skills. We will talk about the 3rd reason first. In the project, students were asked to interview an industry engineer and an engineering professor in the area of their interest. The poor performers were not able to, on account of poor communication skills, even able to come up with required interviews. This despite the fact, that all students were given the contact information of two industry speakers who gave guest lectures in the class. [They could have contacted them at least]. It is also possible that poor performers simply realized that engineering is not their cup of tea.	

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		Certainly in a community college environment, such self-discovery can be done, because fortunately the environment in community colleges is a low risk one. For the students who met the SLO target, I think they communicated well with the instructor and their interviewers, understood class lectures, studied the supporting materials and learned overall art of researching, analyzing, and writing. The student's not meeting success standards could have been due to combination of factors. Typical factors we have seen hindering student success in community colleges are: 1. Lack of engagement. 2. Demanding work and college schedule. 3. Sudden change in student's life condition that required attention and time resources to be redirected from studies towards resolution of such condition. (10/04/2016) **Faculty Assessment Leader:** Satish Singhal **Faculty Contributing to Assessment:** Satish Singhal **Related Documents:** Spring2016PLO_And_SLO_ReportForEngr1.docx	
SLO #2 Apply Academic Success Strategies - Assess the cognitive skills and apply academic success strategies related to the study of engineering. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015), 2016-17 (Spring 2017) **Input Date:** 11/21/2013	**Essay/Written Assignment -** Students are directed to write a one page assessment of their cognitive skills, which they will utilize in their chosen Engineering discipline, which may include: remembering, understanding, applying, analyzing, evaluating, and creating. Also, they will write about applying their academic success strategies related to the study of Engineering, which include: structuring their life to minimize distractions, setting goals, working collaboratively with other students, making effective use of their professors, making a commitment to their study, and		

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	communicating to family and friends about their academic priorities. If a student wrote what was irrelevant to the question, the student earned a score of 0. If the student did not write about any intellectual skills, but wrote about at least one of the academic success skills, the student earned a score of 1. If the student wrote about two levels of intellectual skills and one academic success strategy, the student earned a score of 2. If a student wrote about more than two levels of intellectual skills and more than one academic success strategy, the student earned the maximum score of 3. **Standard and Target for Success:** It is expected that 80% of the students are successful, that is score 2 or 3 for the assignment.		

ECC: ENGR 9:Engr Mechanics - Statics

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SLO #1 Solve Equilibrium Problems - Solve equilibrium problems in two and three dimensions using algebraic or trigonometric methods. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014), 2015-16 (Spring 2016) **Input Date:** 11/21/2013	**Exam/Test/Quiz -** Students were asked to solve the following problem on an exam: Determine the reactions at the beam supports for the given loading if w0 = 300 pounds. See attached diagram. **Standard and Target for Success:** Since this should not be a difficult problem for students at the Engineering 9 level, a 100% success rate has been set as a target. The rubric was based on a 4 point scale with the lowest being 0, corresponding to No Understanding, 1 corresponding to Some Understanding, 2 corresponding to Most Understanding, and 3 corresponding to Complete Understanding. Students earning a 2 or 3 are deemed successful at mastering the SLO, while those scoring 0 or 1 were Unsuccessful. If a student sketched a completely incorrect Free Body Diagram, their score was 0. If the FBD was mostly correct, the student earned 1 point. If the FBD was completely correct, but there was a major algebraic error in the solution, the student earned a score of 2, while if only a minor error occurred, the student earned a score of 3, which is the maximum.		
	Exam/Test/Quiz - Students were asked to: solve the following equilibrium problem:	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Not Met	**Action:** Next time I am going to make the in-class portions of the exam closed book, but perhaps let them

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	Member AB is supported by a cable BC and at a by a square rod, which fits loosely through the square hole in the collar fixed to the member, as shown in the figure. Determine the components of reaction at A and the tension in the cable needed to hold the rod in equilibrium. See related documents for diagram. **Standard and Target for Success:** I am optimistic that at least 75% of the students will earn a score of 2 or 3, based on the rubric below, for this SLO: The points were awarded thusly: 0 Essentially left the problem blank. 1 Drew the free body diagram, more or less correctly, and perhaps tried to write the requisite equations 2 Drew the free body diagram correctly and had the correct, or mostly correct, equations, but did not solve them correctly or completely. 3 Drew the free body diagram correctly, had the correct equations, and solved them correctly or made a trivial mistake.	Scores of 2 and 3 correspond to students being successful and scores of 0 and 1 correspond to students being unsuccessful. A total of 24 students participated in the SLO assessment (1 section). 4% (1 out of 24) scored a 0, 33% (8 out of 24) scored a 1, 21% (5 out of 24) scored a 2, and 42% (10 out of 24) scored a 3. The percentage of students who scored a 2 or 3 was 63%. Thus the targeted goal of a 75% success rate, was not met. The results were not too bad. Overall 62.5% of the students had “complete understanding” or “most understanding”. I would have preferred that to be at least 75%. Quite a few students were in the “some understanding” category and I believe that they could easily move up to the next level of understanding. Mostly they missed the significance of the “square” rod, even though it was emphasized by being put in italics. This was a somewhat complicated problem. However, it was on the take home portion of an exam, so the students had all the time they needed and it was also open book. Many students don’t seem to be able to be bothered to look things up or to check to see that what think is correct actually is. They seem to spend their time trying to find a similar example problem in the book and then copying that approach. Next time I am going to make the in-class portions of the exam closed book, but perhaps let them have a page or two of notes, rather than making it open book. Thus, that way they won’t be looking for similar problems to copy from the text for that portion. It won’t stop them from doing this on the take-home portions, but at least they will not have this as their only strategy. Although this SLO problem had less than optimal results,	have a page or two of notes, rather than making it open book. Thus, that way they won’t be looking for similar problems to copy from the text for that portion. It won’t stop them from doing this on the take-home portions, but at least they will not have this as their only strategy. (05/25/2017) **Action Category:** Teaching Strategies

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		overall the students did well in the course. Every one of the 24 students represented here passed the course with an A, B, or C. This is the first time that I did not have to give any student a D or F. I think that part of the reason for this was that I have started to collect a homework problem a few times each semester and count it into their grade. The feedback is helpful to them. Unfortunately, this also appears to have had the unintended consequence that they undervalue the rest of their homework assignments, which are not graded, and do not devote as much time to working on them as they should. (05/25/2016) **Faculty Assessment Leader:** Milan Georgevich **Faculty Contributing to Assessment:** Jill Evensizer **Related Documents:** SLO E 9 S 16 Results (Jill).pdf	
SLO #2 Use Diagrams to Solve Problems - Draw diagrams and determine distributed forces, shear forces, and moments in beams. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015), 2016-17 (Spring 2017) **Input Date:** 11/21/2013	**Exam/Test/Quiz -** Students are directed to draw the shear and bending moment diagrams for a beam shown in a figure provided. Then they are to determine the shear and moment at the middle of the beam. Students who drew incorrect shear and moment diagrams, or wrote nothing, earned a score of 0, corresponding to "no understanding", while students who drew the shear diagram correctly, but not the moment diagram, earned a score of 1, which corresponded to "some understanding". Scores of 0 or 1 corresponded to students being unsuccessful. Students in the "most understanding" category completed the problem correctly, but did not label axes and constructed incorrect scales, earned a score of 2. Those students in the "complete		

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	understanding" category completed the problem with no errors and earned the maximum score of 3. Scores of 2 and 3 correspond to students being successful at this SLO. **Standard and Target for Success:** The target for success was 90%, since Engineering 9 is an advanced course for a Community College, requiring both a Physics and Calculus II prerequisite.		