Assessment: Course Four Column

MOORPARK COLLEGE

Outcomes - Engineering

Program Purpose: Engineering Program prepares students for transferring to degree completion programs or for earning an Associate of Science Degree by providing high quality education, rigorous UC and CSU transferable engineering courses, with the student-first approach, in order to help students succeed in their educational and career goals. It also prepares students for the work place by providing them with the skills necessary for internships or entry level engineering positions. Students who complete engineering courses will understand the application of engineering principles to the design and manufacturing of products and critically evaluate observations and measurements through the use of accepted engineering methods. They will also be able to apply physical laws, engineering concepts and formulas to analyze engineering problems and synthesize solutions qualitatively and quantitatively. Completers will also communicate engineering design ideas and solutions to problems through engineering drawings, oral presentations, and technical writing.
SLO Coordinator Mtg Date: 01/22/2019
SLO Coordinator Comments: Beetz met with Scarlet Relle. Scarlet's concerns were:

Personal approach to Assessment process according to professor's career point - Individual reporting?
Can we make duplicate courses for individual teachers?
Can definitely add additional CLOs
Can we encourage a More Qualitative discussion

– What is the actual directive where can someone find that information - where is it written? What is the directive?

ENGR M01:Intro to Engineering

CLOs	*Assessment Methods*	*Results & Use of Results*	*Actions*
C01 Concepts and Problem Solving - Demonstrate knowledge of certain basic fundamental laws of physics, engineering concepts, and mathematics in problem solving. **CLO Status:** Active **Next Assessment Scheduled:** 2013-2014 - Spring 2014	**Quiz/Exam/Test -** Answering questions and problem solving on their final exam for the course. **Target:** 80% of the students will be able to answer 70% of the questions on their final exam which involve concepts of physics, engineering and problem solving with a grade of 70 or better. **Notes (optional):** Some of the questions on the final exam are not	**Semester Reported:** 201603 - Spring 2016 **Target Met:** No 79% of the students received 70% or better (09/13/2016)	**Action:** The target of 80% is almost met. The reason for this percentage (79%) is that some students never took the final exam so is dropped the % count. Of those who took the final exam, mostly received As or Bs on their final, there were few Ds and Fs. So in reality there was an improvement of students' grades. However, to increase the number

CLOs	Assessment Methods	Results & Use of Results	Actions
	related to problem solving or physics and engineering concepts.		of students who successfully complete the final exam is to address student problems earlier in the semester and try to help them before the final exam, specially students who stop attending class or stop participating. Also, continue to hand out the study guide earlier rather than a week before the final exam and make time to review it in class and also encourage students to treat the study guide as an assignment and turn in their answers perhaps for extra credit. (09/13/2016) **Follow-Up:** Test again next Spring for consistency of results. (09/13/2016)
		Semester Reported: 201503 - Spring 2015 **Target Met:** No 74% of the students met the target (09/25/2015)	**Action:** Although the instructor provides the students with a study guide, she will make time in the classroom to review the study guide and answer any questions that the students may have. She will consider providing students with "sample problems" for the final exam. (09/25/2015) **Follow-Up:** Retest for this SLO again in the Fall of 2015 or Spring of 2016 to see if the Action plan has made a difference in the student scores. (09/25/2015)
		Semester Reported: 201403 - Spring 2014 **Target Met:** Yes 92% (08/29/2014) **Related Documents:** Final Exam_Student Work_ Middle.pdf Final Exam_Student Work_ High.pdf	**Action:** Although the target has been met, but to have 100% of the students meet the target, the instructor will spend more time reviewing the topics before the final exam. (08/29/2014)

CLOs	Assessment Methods	Results & Use of Results	Actions
		Final Exam_Student Work_ Low.pdf	
C02 Engineering Design Process - Understand, analyze, and synthesize a solution to an engineering problem using the engineering design process. **CLO Status:** Active **Next Assessment Scheduled:** 2013-2014 - Spring 2014	**Group Project -** Group design projects. In groups of 2-3, students will engage in design projects that involve mechanical, electrical, and civil engineering concepts. They will build a product according to specified design criteria (catapult for mechanical engineering, pasta tower for civil engineering, experiment with solar panels on toy solar cars for electrical engineering). **Target:** 80% of the students will receive a score of 80% or better on all these group projects. **Notes (optional):** These scores will be gathered through out the semester and then entered in TracDat.	**Semester Reported:** 201503 - Spring 2015 **Target Met:** No 79% of the students received 80% or above on all 3 design projects. Catapult project: 81% received 80% or above. Pasta Tower project: 92% received 80% or above. Solar Car project: 64% received 80% or above. (10/03/2015) **Related Documents:** SLO Reporting Data Sheet - Spring 2015.xlsx	**Action:** The target of 80% would have been met had it not been for the solar car design project. The solar car design project required greater math and science analysis skills, as such most students did not do well with this project. In order to improve student understanding and consequently the scores, the instructor will do a quick check of the students work in progress before they actually turn it in for final grading. During this interim checking process, the instructor can catch misunderstandings and clarify it for the students. This will hopefully improve understanding of concepts and improve final grades. (10/03/2015) **Follow-Up:** The instructor will implement the action above and will follow it up in Fall 2015 and/or Spring 2016. (10/03/2015)
		Semester Reported: 201403 - Spring 2014 **Target Met:** Yes 81%. This is the average score of all the activities. For the catapult project: 74% of the students received a score of 80% or better on the building and performance of the catapult. For the Pasta Tower Project: 93% received 80% or better on the building and performance. For the Solar Car Project: 76% of the students received a score of 80% or better on the experimental set-up, data analysis, and report writing of the project. (09/06/2014) **Related Documents:** Catapult Project.doc CatapultDesignAssessment _ Rubric.pdf	**Action:** To improve the scores the instructor will give helpful suggestions to the students to improve their design and caution them against commonly made mistakes by the students. (09/06/2014) **Follow-Up:** Compare the results in the next cycle. (09/06/2014)

CLOs	Assessment Methods	Results & Use of Results	Actions
		Pasta Tower Project PastaTowerAssessment_Rubric.pdf Solar Car Experiment	
C03 Team Work and Communication - Develop skills suitable for working in a team, and demonstrate knowledge of effective practices for writing technical reports, making oral presentations, and producing engineering drawings. **CLO Status:** Active **Next Assessment Scheduled:** 2013-2014 - Spring 2014	**Group Project -** Group design projects. In groups of 2-3, students will engage in design projects that involve mechanical, electrical, and civil engineering concepts. They will build a product according to specified design criteria (catapult for mechanical engineering, pasta bridge for civil engineering, experiment with solar panels on toy solar cars or build a solar car using a kit for electrical engineering), write a technical report, and prepare an oral presentation for the class using Power Point or other technology. **Target:** 80% of the students will receive a score of 80% or better on their written report and oral presentation. **Notes (optional):** This SLO will be assessed the same way as the engineering design SLO, as they are closely related to each other.	**Semester Reported:** 201503 - Spring 2015 **Target Met:** No Considering the total of two technical writing reports, 58% received 80% or better on their technical reports. Specifically, on the 1st technical report for the catapult project, 37% received 80% or better and on the 2nd technical report for the pasta tower project, 80% received 80% or better. So a marked improvement is indicated. For the oral presentation, considering the total of two oral presentations, 86% received 80% or better. Specifically, on the 1st oral presentation for the catapult project, 85% received 80% or better and on the 2nd oral presentation for the pasta tower project, 88% received 80% or better. (10/03/2015)	**Action:** As indicated from the Results Section, the oral presentation scores did satisfy the target, and the second technical reports satisfied the target of 80%. The reason for this is because students were given feedback on their first technical report which helped them improve upon the second one. Considering this result, the instructor will share with the students a "Good" and a "sub-optimal" technical report written by previous students (no names will be indicated) and explain to them according to the grading rubrics the scores received. This will help the students to do a better job on their first technical report as well. Furthermore, it should be mentioned that some of the low scores which were responsible for lowering the entire class percentage for both technical writing and oral presentations, are due to students who simply did not turn in any work and thus received zero points. Another action plan, is for the instructor to continually remind and encourage the students to do their work. (10/03/2015) **Follow-Up:** To measure how the indicated action plans above will improve the results, this SLO will be assessed again in Spring

CLOs	Assessment Methods	Results & Use of Results	Actions
			and/or Fall of 2016. (10/03/2015)
		Semester Reported: 201403 - Spring 2014 **Target Met:** No 78%. This is the average of all the scores. For the catapult project: 67% of the students received a score of 80% or better on the technical report; 94% of the students received a score of 80% or better on the Power Point oral presentation. For the Pasta Tower Project: 61% received 80% or better on the technical report; 91% received 80% or better on the oral presentation. For the Solar Car Project: 76% of the students received a score of 80% or better on the analysis and report writing of the project. (09/06/2014) **Related Documents:** Technical writing guidelines+rubric.pdf PowerPointAssessment _ Rubric.pdf	**Action:** To improve the scores for the technical report writing, the instructor will return the first graded work earlier to the students so that they will have more time to review their mistakes, furthermore, the instructor will take a few minutes of the class time to point out the most common writing mistakes made by the students as to clarify any misunderstandings about the grading rubrics. For the oral presentations, the instructor will make constructive comments about each group's presentation as to help the students to improve upon their presentation style. (09/06/2014)
INACTIVE: Engineering Disciplines - Describe the role of engineers in society, classify the different engineering disciplines, and explain the functions of an engineer in those disciplines. **CLO Status:** Inactive **Next Assessment Scheduled:** 2013-2014 - Spring 2014	**Written Assignment -** Students will use the Internet and their textbook to: Describe the function of their assigned engineering discipline, list specific job descriptions for an engineer in that particular discipline, name the appropriate engineering organization for that particular discipline, list two or three universities that offer a major in that discipline, and list some required engineering courses in that major. **Target:** 80% of the students will receive a score of 80% or better on this written assignment.	**Semester Reported:** 201403 - Spring 2014 **Target Met:** Yes 81% (08/11/2014) **Related Documents:** ENGR M01_SLO1_Engr Discipline.pdf Student work.pdf	**Action:** Although the target has been met, the results still need to be improved. To improve the results, the instructor will amend the written assignment by requiring a short oral report (5 minutes), in addition to including two or three questions on the first midterm and also on the final exam to test the students' knowledge of this SLO further. Additionally, although the instructor does invite engineers from the community to speak to the students as often as possible during the semester, the instructor will try harder to invite more speakers to the campus who

CLOs	Assessment Methods	Results & Use of Results	Actions
			can discuss in detail their specific engineering discipline and their role as an engineer in the society. (08/11/2014)
INACTIVE: Academic Pathways - Develop and apply effective strategies to reach full academic potential, and identify academic pathways to a four-year degree in some engineering discipline. **CLO Status:** Inactive **Next Assessment Scheduled:** 2013-2014 - Spring 2014	**Capstone Assignment -** Students will make an appointment to see an engineering counselor at Moorpark College and develop an educational pathway. **Target:** 90% of the students will present to the instructor their educational plan after visiting with the engineering counselor. **Notes (optional):** They will have until the end of the semester to do this.	**Semester Reported:** 201403 - Spring 2014 **Target Met:** No 48% of the students who received this assignment completed it. (08/26/2014)	**Action:** Invite the engineering counselors to my classes to talk to the students about the importance of developing an educational plan earlier in the semester. Give the students more time to complete this assignment. (08/26/2014)
INACTIVE: Engineering Ethics - Explain engineering ethical principles, standards, and code of conduct. **CLO Status:** Inactive **Next Assessment Scheduled:** 2013-2014 - Spring 2014	**Group Project -** Analysis of an ethical dilemma **Target:** 80% of the students will receive a score of 80% or better in analyzing an ethics-related case that has been brought before NSPE's (National Society of Professional Engineers) Board of Ethical review. These cases have been adapted by permission and appear in the textbook.		

ENGR M04:Engineering Design/Cad

CLOs	Assessment Methods	Results & Use of Results	Actions
C01 Team work and communication - Develop an appreciation for team work and the various ways that engineers communicate including technical writing, oral presentations, and technical drawings. **CLO Status:** Active **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Quiz/Exam/Test -** 80% of students should successfully answer one multiple choice question on the exam relevant to technical drawings as a method of communication. **Target:** 80% **Notes (optional):** This SLO is mainly tested as design project but one multiple choice question was included on the exam.	**Semester Reported:** 201403 - Spring 2014 **Target Met:** No 0% (09/06/2014) **Related Documents:** SLO Test Questions for ENGR M04 related to SLO.pdf	**Action:** All students missed this one multiple choice question. Similar to the last reporting cycle, I believe students still have a hard time with the word "scaled". I will try to stress the fact that in CAD drawings are not "scaled" rather drawn to full size. They are only scaled when they are printed to a printer/paper. (09/06/2014) **Follow-Up:** Test again this semester. (09/06/2014)
		Semester Reported: 201203 - Spring 2012 **Target Met:** No 2% (10/07/2012)	**Action:** 98% of students missed this one multiple choice questions regarding the benefits of technical drawings with computers. I believe students were confused with the use of the word "scaled" drawings. Explain this concept that engineering drawings do not need to be scaled in CAD drawings more in class. (10/07/2012)
	Group Project - 80% of students must successfully complete a group design project with a grade of B or better. **Target:** 80%	**Semester Reported:** 201503 - Spring 2015 **Target Met:** No Two group design projects were conducted, and the target of 80% was met for some engineering communication skills and were not met for some others. Results are as follows: For oral presentations, 96% and 88% of the students received a score of 80% or better on the first and second design project presentation, respectively. For technical drawings, 100% and 79% received a score of 80% or better on their first and second design project drawing, respectively. For technical writing, 70% of the students received 80% or better on the first desing project writing. (10/03/2015) **Related Documents:** SLO Reporting Data Sheet - Spring 2015.xlsx	**Action:** According to the assessment results, the target is met for most engineering teamwork communication styles, except for technical writing and the second design project drawing which had to do with three dimensional modeling. The action plan is for the instructor to take the students to the library to learn about proper and effective library research techniques, to give the students technical report writing rubrics, guidelines, and to share with them "good" and "sub-

CLOs	Assessment Methods	Results & Use of Results	Actions
			optimal" reports written by students (no names mentioned) in the previous semesters. For the 3-D modeling, the instructor will give the students more time to complete the drawing by starting the second design project sooner. (10/03/2015) **Follow-Up:** To follow-up the results and the effectiveness of the action plan, will assess this SLO again in the Spring and/or Fall 2016. (10/03/2015)
		Semester Reported: 201403 - Spring 2014 **Target Met:** Yes 86% (09/06/2014) **Related Documents:** DesignProject#1.pdf DesignProject #2.pdf Technical writing guidelines.pdf	**Action:** To improve this outcome, the technical writing portion needs to be improved specifically. The instructor will try to provide more help with technical writing through the use of grading rubrics and give earlier feedback on the first technical writing to improve the scores for the second one. (09/06/2014)
		Semester Reported: 201203 - Spring 2012 **Target Met:** Yes 81% of students earned a grade of B or better on their design project. (10/07/2012)	**Action:** Target met. Check again for consistency. (10/07/2012)
C02 Engineering design process - Use the engineering design process to develop a product design and solve an engineering problem **CLO Status:** Active **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Group Project -** 80% of students will complete an engineering design project with a grade of B or better. **Target:** 80% **Notes (optional):** Group Design Project	**Semester Reported:** 201503 - Spring 2015 **Target Met:** Yes This SLO really should be combined with SLO1 regarding teamwork. For this reporting cycle, however, the same results as for the SLO1 (teamwork) should be applied to this SLO as well. (10/03/2015)	**Action:** Combine with SLO1 for the next reporting cycle. (10/03/2015)
		Semester Reported: 201403 - Spring 2014 **Target Met:** Yes 86% of the students from 2 sections of this course completed 2 design projects with a grade of B or better. (09/06/2014)	**Action:** Target met. Reassess for consistency. (09/06/2014)

CLOs	Assessment Methods	Results & Use of Results	Actions
		Semester Reported: 201203 - Spring 2012 **Target Met:** Yes 81% of students completed their design project with a grade of B or better. (10/07/2012)	**Action:** Target met. Follow-up for consistency. (10/07/2012)
C03 Drafting - Students will be able to generate two- and three-dimensional engineering drawings using hand-drafting and computer-aided drafting software following standard drawing conventions recognized in the field of engineering. **CLO Status:** Active			
INACTIVE: Engineering disciplines - Discuss the four major disciplines of engineering and the role of an engineer in the society. **CLO Status:** Inactive **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Quiz/Exam/Test -** 80% of students must successfully answer the 2 questions related to this SLO. **Target:** 80% **Notes (optional):** 2 questions on the test related to this SLO.	**Semester Reported:** 201403 - Spring 2014 **Target Met:** No 68% of the students answered the 2 questions that were related to this SLO correctly. (09/06/2014) **Related Documents:** SLO Test Questions for ENGR M04 related to SLO.pdf	**Action:** To improve the outcome, the instructor should periodically remind the students about the role of engineers in the society, relate this SLO to their design projects, and try to invite more engineers from the various fields to the classroom to speak to the students. (09/06/2014)
		Semester Reported: 201203 - Spring 2012 **Target Met:** No 42% of students answered both questions correctly. (10/07/2012)	**Action:** Almost 50% of the students answered one out of two questions correctly. Spend more time explaining the roles of engineers in the society. After each guest speaker's visit ask students to write three things that they learned from his/her presentation. (10/07/2012)
INACTIVE: Orthographic projections - Distinguish between 1st angle and 3rd angle orthographic projections, read technical drawings, and draw orthographic projections free hand. **CLO Status:** Inactive **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring	**Quiz/Exam/Test -** 80% of students must successfully answer one question on the multiple choice exam regarding this SLO. **Target:** 80% **Notes (optional):** This is just one method of assessment. The main method of assessment is an	**Semester Reported:** 201403 - Spring 2014 **Target Met:** Yes 82% (09/06/2014) **Related Documents:** Test Question .pdf	**Action:** To improve results, perhaps add an orthographic projection drawing to the first midterm as a reminder. (09/06/2014)
		Semester Reported: 201203 - Spring 2012 **Target Met:** No	**Action:** Periodically remind students that all six views of

CLOs	Assessment Methods	Results & Use of Results	Actions
2013 **Start Date:** 03/15/2012	extensive assignemnt given on free hand drawing of orthographic projections.	69% of students answered the one multiple choice question regarding orthographic projections. (10/07/2012)	orthographic projections are sometimes drawn, but normally only three views: front, top, and right side are drawn. (10/07/2012)
	Written Assignment - 80% of students must earn a letter grade of B or better on an assignment exclusively designed for testing student knowledge on orthographic projections. **Target:** 80%	**Semester Reported:** 201403 - Spring 2014 **Target Met:** Yes 98% completed this assignment with a grade of B or better. (09/06/2014)	**Action:** Target met. Will assess again for consistency. (09/06/2014) **Follow-Up:** Need to scan the assignment for the records. (09/06/2014)
		Semester Reported: 201203 - Spring 2012 **Target Met:** Yes 97% completed this assignment with a grade of B or better. (10/07/2012)	**Action:** Target met. Test again for consistency. (10/07/2012)
INACTIVE: CAD program - Generate two-dimensional, isometric, and limited three-dimensional drawings using computer aided drafting program. **CLO Status:** Inactive **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Quiz/Exam/Test -** 80% of students must successfully answer 5 out of 8 questions on a multiple choice exam regarding this SLO. **Target:** 80% **Notes (optional):** Another means of assessment is to consider the students' grades on their CAD drawings though out the semester.	**Semester Reported:** 201403 - Spring 2014 **Target Met:** No 66% (09/06/2014) **Related Documents:** ENGR M04 SLO Test Questions for SLO.pdf	**Action:** All multiple choice questions regarding this SLO were related to the AutoCAD portion of the course, not the latter Creo portion. So might consider either adding some Creo related questions or reviewing with students the AutoCAD concepts more prior to testing. (09/06/2014)
		Semester Reported: 201203 - Spring 2012 **Target Met:** Yes 83% answered at least 5 questions correctly regarding this SLO. (10/07/2012)	**Action:** Target met. Test again for consistency. (10/07/2012)
	Portfolio Review - 80% of students will have earned a letter grade of B or better on their CAD drawings throughout the semester. **Target:** 80% **Notes (optional):** Consider the students' CAD drawing grades from Ch. 1-Ch. 12.	**Semester Reported:** 201403 - Spring 2014 **Target Met:** Yes 88% (09/06/2014)	**Action:** Target is met, however, might want to include more open lab hours to give greater opportunities to students to complete their drawings. (09/06/2014)
		Semester Reported: 201203 - Spring 2012 **Target Met:** No 75% (10/07/2012)	**Action:** Although 75% of students met the target, but it is noteworthy to mention that most

CLOs	Assessment Methods	Results & Use of Results	Actions
			of these 75% , 89% of them, received a letter grade of A. Provide more open lab hours for students to complete their drawings. (10/07/2012)

ENGR M10:Programming and Problem Solving in MATLAB

CLOs	*Assessment Methods*	*Results & Use of Results*	*Actions*
C01 - Learn and use the MATLAB environment to implement moderately complicated algorithms in a coherent and structured manner to solve problems in science and engineering. **CLO Status:** Active **Start Date:** 09/12/2016			
C02 - Learn and apply numerical methods in order to solve problems in science and engineering. **CLO Status:** Active **Start Date:** 09/12/2016			

ENGR M12:Engineering Materials

CLOs	Assessment Methods	Results & Use of Results	Actions
C01 Material Selection - Propose an appropriate material for a particular application based on design and performance criteria, material properties, economics, and societal and environmental impacts. **CLO Status:** Active **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Quiz/Exam/Test -** 80% of students correctly answer 70% of questions related to this SLO. **Target:** 80% **Notes (optional):** 3 questions on the multiple choice exam are related to this SLO.	**Semester Reported:** 201503 - Spring 2015 **Target Met:** No 57% (10/03/2015)	**Action:** 42 points on the cumulative final exam were related to this SLO. In order to improve the results, the instructor will hand out the Final Exam Review Guide sooner than one week prior to the final exam, and she will be sure to spend some time in the classroom reviewing the concepts that were covered in the beginning of the semester. She will also draw the students' attention to figures and diagrams and the importance of being able to interpret them while answering questions. (10/03/2015) **Follow-Up:** Will assess again in the Fall or Spring of 2016. (10/03/2015)
		Semester Reported: 201203 - Spring 2012 **Target Met:** No 77% (10/07/2012)	**Action:** Most students missed the first question. Spend more time explaining the relationship between processing and property. (10/07/2012)
C02 Material failure - Identify, explain, and calculate various design parameters related to material failure. **CLO Status:** Active **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Quiz/Exam/Test -** 80% of students must successfully answer 2 out of 3 questions related to this SLO on the multiple choice exam. **Target:** 80% **Notes (optional):** Material failure is an extensive topic that is covered in multiple chapters. On the multiple choice exam only 3 questions relevant to this topic are incorporated. But perhaps other assessment methods should be	**Semester Reported:** 201503 - Spring 2015 **Target Met:** No 70% of the questions on the final exam related to this SLO were answered correctly by 70% of the students. (10/03/2015)	**Action:** In order to improve the results, the instructor will hand out the Final Exam Review Guide sooner than one week prior to the final exam, and she will be sure to spend some time in the classroom reviewing the concepts that were covered in the beginning of the semester. She will also draw the students' attention to figures and diagrams and the importance of being able to interpret them while

CLOs	Assessment Methods	Results & Use of Results	Actions
	considered that are also related to this topic.		answering questions. (10/03/2015)
		Semester Reported: 201203 - Spring 2012 **Target Met:** No 45% (10/07/2012)	**Action:** Spend more time reviewing the various types of material failure. (10/07/2012)
C03 Interrelationships and engineering materials - Explain the interrelationships between processing, structure, properties, and performance for various engineering materials such as metals, polymers, ceramics, composites, and semiconductors. **CLO Status:** Active **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Capstone Assignment -** 80% of students must successfully complete a written design project related to material selection with a grade of B or better. **Target:** 80% **Notes (optional):** Students were given approximately 2 months to complete this assignment. They visited the library to learn about appropriate research sources, they had intermediate due dates for paper outline and rough draft. Complete set of instructions for this written assignment was given to the students.	**Semester Reported:** 201503 - Spring 2015 **Target Met:** Yes 93% (10/03/2015)	**Action:** Although, the target is met, it is less than 100% because 2 students did not complete this assignment. In order to improve the results, the instructor will be sure to have interim due dates for the design project, such as an outline and a rough draft due date, in order to be sure that students are on task. This way, if some students are not turning in the required assignments for the design project, the instructor can intervene before the due date and hopefully encourage them to complete the assignment. (10/03/2015)
		Semester Reported: 201403 - Spring 2014 **Target Met:** Yes 100% (09/06/2014) **Related Documents:** ENGR M12 - Design Project.pdf	**Action:** Although the target was met. But will amend the assignment by asking students to also give an oral presentation of their design project. (09/06/2014)
		Semester Reported: 201203 - Spring 2012 **Target Met:** Yes 95% of students earned a grade of B or better on this assignment. (10/07/2012)	**Action:** Target met. Follow-up for consistency. (10/07/2012)
INACTIVE: Chemical bonds - Discuss the nature of chemical bonds and their affects on microscopic structure and macroscopic properties of crystalline and non-crystalline materials.	**Quiz/Exam/Test -** 80% of students will correctly answer the two questions related to this SLO on the multiple choice exam. **Target:** 80% **Notes (optional):** Only two	**Semester Reported:** 201203 - Spring 2012 **Target Met:** No 55% (10/07/2012)	**Action:** Perhaps more questions regarding this SLO need to be incorporated into the exam. (10/07/2012)

CLOs	Assessment Methods	Results & Use of Results	Actions
CLO Status: Inactive **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	questions related to this SLO are on the multiple choice exam.		
INACTIVE: Material properties - Discuss and calculate mechanical properties, chemical properties, electrical properties, thermal properties, and magnetic properties for various engineering materials. **CLO Status:** Inactive **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Quiz/Exam/Test -** 80% of students must correctly answer 3 out of 5 questions regarding this SLO. **Target:** 80%	**Semester Reported:** 201203 - Spring 2012 **Target Met:** No 59% (10/07/2012)	**Action:** 13 out of 22 students answered at least 3 out of 5 questions correctly on this SLO. Review these topics and emphasize them more in class. (10/07/2012)
INACTIVE: Diffusion - Distinguish between steady-state and non-steady state diffusion; explain what factors influence diffusion, and solve for diffusion rates. **CLO Status:** Inactive **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Quiz/Exam/Test -** 80% of students must answer one question on diffusion correctly on the multiple choice exam. **Target:** 80% **Notes (optional):** Although,there was only one question regarding this SLO on the exam, students have been quizzed on this topic exclusively. We may consider using those results also as a means of assessment.	**Semester Reported:** 201203 - Spring 2012 **Target Met:** No 64% answered that one question correctly (10/07/2012)	**Action:** Review the concept of diffusion with the class towards the end of the semester to refresh student memory. (10/07/2012)

ENGR M122:Independent Study- Engineering

CLOs	*Assessment Methods*	*Results & Use of Results*	*Actions*
C01 - Specific outcomes will depend upon the topics developed. Geography is a broad discipline concerned with both natural and social science topics. **CLO Status:** Active			

ENGR M12L:Engineering Materials Laboratory

CLOs	*Assessment Methods*	*Results & Use of Results*	*Actions*
C01 - Gather and analyze experimental data, and discuss experimental findings as they relate to material processing, structure, and property. **CLO Status:** Active			
C02 - Measure material properties using standard materials testing equipment and techniques. **CLO Status:** Active			

ENGR M16:Engr Stat/Strength-Mat

CLOs	Assessment Methods	Results & Use of Results	Actions
C01 Design - In groups of 2 or 3 employ engineering problem solving techniques and the engineering design process to design, analyze, build, and present a truss bridge made out of Popsicle sticks. **CLO Status:** Active **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Quiz/Exam/Test -** 70% of students answer at least 5 out of 8 questions correctly related to this SLO on a multiple choice exam. **Target:** 70%	**Semester Reported:** 201503 - Spring 2015 **Target Met:** No Changed the assessment method - used the final exam to assess if 80% of the students could at least earn 70% of the points related to this SLO - 36 points out of 452 points. 70% of the students were successful in achieving the new Target. This SLO result could also be directly compared to the the students' first exam grade as it was entirely based upon this particular SLO. On the first exam, only 36% of the students earned at least 70% of the points. So it is clear that the results have improved from the beginning to the end of the semester, although the 80% target for the percentage of students answering 70% of the questions on this topic has not been reached. (10/04/2015) **Related Documents:** Exam I - Ch. 1-5.pdf ENGR M16_Final Exam.pdf	**Action:** Change the target and the means of assessment. To improve student learning outcome results, give students a study guide prior to the final exam to review some of the more basic and important concepts learned throughout the semester. Give them more problems related to these topics with their solutions as a study guide. (10/04/2015) **Follow-Up:** Follow-up by implementing the target and assessment changes and test again either in the Spring and/or Fall of 2016. (10/04/2015)
		Semester Reported: 201203 - Spring 2012 **Target Met:** No 42% answered at least 5 questions correctly. Majority of students (12 out of 19 students) answered 4 and 5 questions correctly. (10/07/2012)	**Action:** Answering these questions required calculations. Consider allocating more time to students to complete this exam. (10/07/2012)
C03 Mechanical Properties - Discuss and calculate mechanical properties related to stress-strain diagrams and Mohr's circle for commonly used engineering materials. **CLO Status:** Active **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Quiz/Exam/Test -** 70% of students must answer 4 out of 6 questions related to this SLO correctly on the multiple choice exam. **Target:** 70%	**Semester Reported:** 201503 - Spring 2015 **Target Met:** No Changed the assessment method - used the final exam to assess if 80% of the students could at least earn 70% of the points related to this SLO - 32 points out of 45 points 60% of the students were successful in achieving the new Target (10/04/2015) **Related Documents:** ENGR M16_Final Exam.pdf	**Action:** Combine SLO2 and SLO3. Change the target and the means of assessment. Compare assignment grades related to this SLO to the Final Exam points earned related to this SLO, if possible. To improve student learning outcome results, give students a study guide prior to the final exam to review some of the more basic and important concepts learned throughout the semester. Give them more problems related to these topics with their solutions as a study

CLOs	Assessment Methods	Results & Use of Results	Actions
			guide. (10/04/2015) **Follow-Up:** Make the proposed changes to this SLO and follow-up again either in the Spring and or Fall of 2016. (10/04/2015)
		Semester Reported: 201203 - Spring 2012 **Target Met:** No 47% answered at least 4 questions correctly on the exam. (10/07/2012)	**Action:** Since all these questions required calculations. Consider allocating more time to the students to take this exam as no one student answered all 6 questions correctly and majority of students had answered 3 and 4 questions correctly. (10/07/2012)
C03 Centroids and area moment of inertia - Use the geometric properties of bodies such as center of gravity, centroid, and area moment of inertia appropriately to assist in calculating resultant forces and internal loadings. **CLO Status:** Active **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Quiz/Exam/Test -** 70% of students must successfully answer one of the two questions on the multiple choice exam which incorporated this concept as one of the necessary steps in the problem solving strategy. **Target:** 70% **Notes (optional):** These two questions on the multiple choice exam were not exclusively testing for this concept, however, knowing how to calculate centroid and/or the area moment of inertia was one of the necessary steps in the problem solving strategy.	**Semester Reported:** 201503 - Spring 2015 **Target Met:** No Use the same result as in SLO2. (10/04/2015)	**Action:** This SLO really should be combined with SLO2 as this is too specific and this concept is really a tool or a mid-step in solving engineering problems related to equilibrium of rigid bodies. (10/04/2015) **Follow-Up:** Will follow-up by combining this SLO and assessing again either in the Spring and or Fall of 2016. (10/04/2015)
		Semester Reported: 201203 - Spring 2012 **Target Met:** Yes 89% of students answered one or both questions correctly. 84% of students answered both questions correctly. (10/07/2012)	
C04 Engineering Statics problem solving techniques - Apply appropriate engineering problem solving techniques including free body diagrams, shear and bending moment diagrams, to identify and apply appropriate laws of physics and engineering equations, to problems	**Quiz/Exam/Test -** 70% of students must answer the one question on the multiple choice exam which requires ascertaining mechanical property information from a stress-strain diagram in order to solve the problem. **Target:** 70%	**Semester Reported:** 201503 - Spring 2015 **Target Met:** Yes Means of assessment is changed - Used the Final Exam 80% of the students successfully answered 70% of the questions related to this SLO - 22 points out of 31 points related to this SLO (10/04/2015) **Related Documents:** ENGR M16 - Final Exam	**Action:** A better means of assessment for next time would be to compare student scores from particular assignments such as quizzes related to these topics to their scores on their final exam related to these topics. Will consider doing this for the next

CLOs	Assessment Methods	Results & Use of Results	Actions
that do not result in rigid body motion including static equilibrium and statically indeterminate axially loaded systems. **CLO Status:** Active **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring 2013 **Start Date:** 03/15/2012	**Notes (optional):** Although only one question about this SLO was asked on the multiple choice exam, this topic is extensively covered and tested in the course.		reporting cycle. (10/04/2015) **Follow-Up:** Will follow up in the Fall and/or Spring of 2016. (10/04/2015)
			Action: Although the new target is met using the new means of assessment which seems more indicative of student learning than just one multiple choice question, this needs to be tested and assessed again to ensure consistency. Also, the Target and the Assessment Method needs to change. (10/04/2015) **Follow-Up:** Will change the Target and the Means of Assessment, and will follow-up either in the Spring and/or Fall of 2016. (10/04/2015)
		Semester Reported: 201203 - Spring 2012 **Target Met:** No 37% of students, 7 out of 19, answered this one question correctly. (10/07/2012)	**Action:** This topic was covered extensively. Incorporate more questions on this topic as part of the exam to have a better assessment of the target percentage. Alternatively, give students a written assignment only on this topic to better assess the success of this SLO. (10/07/2012)
C05 Force and Moment - Apply appropriate knowledge of physics, engineering, and mathematics to explain, calculate and manipulate vector quantities such as resultant force and moment of a force about a point or an axis. **CLO Status:** Active **Next Assessment Scheduled:** 2012-2013 - Fall 2012, 2012-2013 - Spring	**Group Project -** 80% of students will successfully complete a bridge building design project in groups of 2 or 3 earning a grade of B or better. **Target:** 80%	**Semester Reported:** 201503 - Spring 2015 **Target Met:** Yes 100% of students met this target. The final result is based upon the design project construction, force analysis, and technical report writing. All scores for the various parts of this design project were at the minimum 80% of the maximum allowable points. The results indicated that in general, students do better in group projects where they can help each other and utilize each other's strong suits in achieving the goals of a project	**Action:** Assess again for consistency. (10/04/2015) **Follow-Up:** Will follow-up again either in the Spring and/or Fall of 2016. (10/04/2015)

CLOs	Assessment Methods	Results & Use of Results	Actions
2013 **Start Date:** 03/15/2012		and or assignment. Furthermore, students benefit from clear instructions in regards to the project expectations and clear grading rubrics. (10/04/2015) **Related Documents:** ENGR M16_Bridge Rules for Sp2015.pdf ENGR M16_Technical Writing Rubric.pdf	
		Semester Reported: 201403 - Spring 2014 **Target Met:** Yes 100% (09/06/2014)	**Action:** Target is met. This was a successful project for the students. The lowest grade was 87%. I believe students benefited by having more time and by reviewing the concepts of truss force analysis in class before the project was due. Test again for consistency. (09/06/2014) **Follow-Up:** This was a successful project for the students. The lowest grade was 87%. I believe students benefited by having more time and by reviewing the concepts of truss force analysis in class before the project was due. Furthermore, the students were provided with a technical writing rubric. Employ this same strategy in subsequent semesters as well. (09/06/2014)
		Semester Reported: 201203 - Spring 2012 **Target Met:** Yes 89% of the students earned a grade of B or better on the design, analysis, construction, and presentation of their design project. (10/07/2012)	**Action:** Target met. Follow-up for consistency. (10/07/2012)

ENGR M18:Engineering Dynamics

CLOs	Assessment Methods	Results & Use of Results	Actions
C01 Problem Solving - Students will be able to (in groups of 2 or 3) employ engineering problem solving techniques and the engineering design process to design, analyze, build, and present a mass projectile. **CLO Status:** Active			
C02 Plane Motion - Students will be able to employ work-energy and impulse-momentum principles in solving engineering problems involving plane motion as an alternative method to Newton's laws of motion. **CLO Status:** Active			
C03 Demonstrate - Students will be able to demonstrate an understanding of Newton's laws of motion and apply them to typical engineering problems involving particle kinetics and rigid body kinetics in plane motion. **CLO Status:** Active			
C04 Analyze - Students will be able to analyze rigid body motion in two dimensions with respect to both absolute and relative motion descriptions. **CLO Status:** Active			
C05 Apply - Students will be able to apply concepts of displacement, velocity, constant acceleration, and curvilinear motion of particles as both scalar and vector quantities. **CLO Status:** Active			

ENGR M20:Elec Engr Fundamentals

CLOs	Assessment Methods	Results & Use of Results	Actions
C01 Computer Use - Students will be able to use a computer to design and analyze electrical circuits of average complexity appropriate for the course. **CLO Status:** Active			
C02 Analyze - Students will be able to analyze and synthesize solutions to electrical circuit problems of reasonable complexity, and evaluate the results according to electrical engineering concepts and principles. **CLO Status:** Active			
C03 Equations - Students will be able to recognize, recall, and apply the equations that describe resistive, alternating current, and transient circuits and operational amplifiers such as Ohm's law, Kirchoff's laws, Wye-delta transformations, nodal and mesh analysis, Thevenin and Norton equivalent circuits, and sinusoidal steady-state analysis. **CLO Status:** Active			
INACTIVE: Kirchhoff's Laws - Use Kirchhoff's Voltage Law and Kirchhoff's Current Law to analyze multiple loops and nodes in DC and AC circuits. **CLO Status:** Inactive **Next Assessment Scheduled:** 2013-2014 - Spring 2014 **Start Date:** 05/01/2014	**Quiz/Exam/Test -** SLO Multiple Choice Exam **Target:** 75% of the students can answer all the questions related to Kirchhoff's Laws perfectly.	**Semester Reported:** 201403 - Spring 2014 **Target Met:** No 70% of the students were able to perform the above task with no difficulty (09/15/2014)	**Action:** Spend more time in the classroom on this topic. Also, might want to consider changing the assessment method to obtain a better measurable result. (09/15/2014)
INACTIVE: First and second order circuits - Use differential equation methods to set up first order and	**Quiz/Exam/Test -** SLO Multiple Choice Exam **Target:** 70% of the students will be	**Semester Reported:** 201403 - Spring 2014 **Target Met:** No 60% of the students were able to perform the above task	**Action:** Spend more time in the classroom in this topic. Design laboratory experiments to parallel

CLOs	Assessment Methods	Results & Use of Results	Actions
second order circuits. **CLO Status:** Inactive **Next Assessment Scheduled:** 2013-2014 - Spring 2014 **Start Date:** 05/01/2014	able to answer all the questions related to first and second order circuits perfectly.	with no difficulty (09/15/2014)	this topic in the lecture. Might want to alter the assessment method to obtain better measurable results. (09/15/2014)
INACTIVE: Use of Multimeter - Use a multimeter to measure resistances, voltages, and Direct and Alternating currents **CLO Status:** Inactive **Next Assessment Scheduled:** 2013-2014 - Spring 2014 **Start Date:** 05/01/2014	**Group Project -** Laboratory Experiments **Target:** 70% of the students can use a multimeter to perform tasks related to measuring resistances, voltages, and currents	**Semester Reported:** 201403 - Spring 2014 **Target Met:** Yes 90% of the students were able to perform the above task with no supervision (09/15/2014)	**Action:** Target met. Reassess for accuracy and consistency. (09/15/2014)
INACTIVE: Using PSPICE - Personal Simulation Program with Integrated Circuit Emphasis - Use Personal Simulation Program with Integrated Circuit Emphasis (PSPICE) to simulate DC and AC circuits and display voltage and current wave forms. **CLO Status:** Inactive **Next Assessment Scheduled:** 2013-2014 - Spring 2014 **Start Date:** 05/01/2014	**Group Project -** Laboratory Experiments **Target:** 70% of the students will be able to use PSPICE to simulate and analyze DC and AC circuits.	**Semester Reported:** 201403 - Spring 2014 **Target Met:** Yes 75% of the students were able to perform the above task with no supervision (09/15/2014)	**Action:** Target met. Reassess for accuracy and consistency. (09/15/2014)

ENGR M20L:Elec Engr Fundamentals Lab

CLOs	*Assessment Methods*	*Results & Use of Results*	*Actions*
C01 PSPICE - Students will be able to use PSPICE or similar computer software, design and analyze electronic circuits of average complexity appropriate for the course. **CLO Status:** Active			
C02 Experimental Procedures - Students will be able to reduce and analyze the data for error propagation, critically evaluate the experimental results based on expected theoretical values and/or other relevant information, and draw conclusions regarding the experimental procedures. **CLO Status:** Active			
C03 Analyze - Students will be able to analyze data, construct and examine graphs, and write formal or informal laboratory reports using appropriate technical writing format and language. **CLO Status:** Active			
C04 Instruments - Students will be able to make measurements using common laboratory instruments and record the data. **CLO Status:** Active			