BASIC PROGRAM INFORMATION

Program Review is about documenting the discussions and plans you have for improving student success in your program and sharing that information with the college community. It is also about linking your plans to decisions about resource allocations. With that in mind, please answer the following questions.

Program/Department Name: Physics and Engineering

Division Name: PSME

Please list all team members who participated in this Program Review:

Name	Department	Position
Sarah Parikh	Engineering and Physics	Instructor
David Marasco	Physics	Instructor
Sue Wang	Engineering and Physics	Instructor
Frank Cascarano	Physics	Instructor

Number of Full Time Faculty: 4 **Number of Part Time Faculty:** 16

Please list all existing Classified positions: *Example: Administrative Assistant I*

Jenny Liang - Instructional Lab Coordinator

SECTION 1: PROGRAM REFLECTION

1A. Program Update: Based on the program review data, please tell us how your program did last year. We are particularly interested in your proudest moments or achievements related to student success and outcomes.

Numerical Data - Physics has grown by 5% in enrollment and 2% in WSCH, this is consistant a pattern of growth over the past few years. Engineering has grown by 60%. The Full-time FTEF was at 36% for 2014-2015. The biomedical engineering program was introduced and was met with enthusiasm. Nine students completed the program and were granted certificates. In addition, six sections of Engineering 10 were offered, expanding our academic year sections offered by 50%. Furthermore, Engr 47: Dynamics was offered for the first time - adding yet another course to our list of engineering course offerings that draw students to Foothill College.

The Physics and Engineering departments feature strong instruction, our students' performance on industry-standard metrics such as the Force Concept Inventory and the Mechanics Baseline Test is well above national norms. We have flipped many of our classrooms, and most faculty have a strong commitment to learning and implementing the latest in education research.

The core of the departments is very collegial and we meet on a weekly basis to discuss instruction, curriculum and other departmental matters. We are agile, aggressive and work well together.

The Physics Show continues to be our flagship outreach event, we expect to serve about 20,000 people this academic year, including roughly 3,500 students from local Title 1 schools. We believe this is the largest single-institution annual science outreach event on the West Coast.

Our department of four FT faculty also leads the following efforts. The STEM newsletter now has a subscription base of 2000 and informs our students of opportunities on our campus and beyond. We have an active Science and Engineering Club with a membership of 80. We have STEM Day in the Fall, and the Physics Olympics in the Spring. In 2014-15 we are offered leadership lunches that brought together our students with leaders from the local STEM professional community. We offer the F=ma contest for local Physics high school students. The department also took the lead on the American Mathematics Association of Two Year Colleges's annual contest, Foothill finished 8th in the nation. We offer a departmental scholarship program that will award $2000 this year. We take leadership in the local (statewide) professional association for our field (which includes organizing and running two conferences a year). In addition, department faculty serve on a number of shared governance committees, including involvement in the Title IX structure, Academic Senate, BEST, and faculty chair of the Scholarships and Elections committees. This is in addtition to both hiring and tenure committees.

Finally, in 2014-15 Frank Cascarano was named as a Fellow of the American Assocation of Physics Teachers and David Marasco flew on a NASA mission. These are achievements of the highest order.

1B. Program Improvement: What areas or activities are you working on this year to improve your program? Please respond to any feedback from the supervising administrator from last year's program review.

In order to better serve gender equity, the department took a class on gender communitcation this past summer. In addition, faculty attended a workshop on Retention and Recruitment of Women in STEM during which we developed action plans and targets for enrollment and success. The physics department is very excited to have started the process for hiring a new full-time faculty member.

1C. Measures of Success: What data or information will you use to measure your success (e.g. student success rates, changes in student or program learning outcomes)?

Student success rates, by gender, for each course would be considered, if available, to assess areas for improvement for equity in the classroom.

The number of students declaring engineering as a major, if available, would be considered as a measure of success for the community of scholars that we are fostering through our classrooms and beyond.

The number of students who have declared engineering as a major AND who transfer into an engineering program, if available, would be considered as a measure of success for the academic preparation in engineering and core transfer courses. In addition, this measure broken down by gender and ethnicity would indicate the success of our atmosphere in supporting a diverse STEM workforce. This data is necessary to understand if changes to our program are helpful to students.

1D. EMP Goal: The 2015-2020 Educational Master Plan (EMP) includes the following goal:
"Create a culture of equity that promotes student success, particularly for underserved students."

Based on the program review data, tell us some of the things your program will be doing this year to support this goal. You will be asked to report on any accomplishments on your next comprehensive program review.

The number of latino/latina students that are being served in Physics is shrinking. This trend has come to

the attention of the department, and we would like to take action on this as opportunities arise. Based on the Recruitment and Retention of Women in STEM workshop, new support activities are being integrated into the Engineering 10 curriculum including hands-on experience soldering and assembling small machines to support students without the means or access to these materials.

SECTION 2: PROGRAM OBJECTIVES & RESOURCE REQUESTS

2A. New Program Objectives: Please list any new objectives (do not list your resource requests).

Program Objective	Implementation Timeline	Progress Measures
Example: Offer 2 New Courses to Meet Demand	*Winter 2016 Term*	*Course Enrollment*
1. Hire an outstanding new Physics faculty member	Winter 2016	Position filled
2. Continue to expand Engr 10 section offerings	Fall 2016	Enrollment

2B. Resource Requests: Using the table below, summarize your program's unfunded resource requests. Refer to the Operations Planning Committee (OPC) website for current guiding principles, rubrics and resource allocation information.

Resource Request	$	Program Objective (Section 2A)	Type of Resource Request			
			Full-Time Faculty/Staff Position	One-Time B-Budget Augmentation	Ongoing B-Budget Augmentation	Facilities and Equipment
Lab Equipment (see attached spreadsheet)	$30k	#2	☐	☐	☐	☒
STEM Community Building Funding	$4k	#2	☐	☐	☒	☐
			☐	☐	☐	☐

2C. Unbudgeted Reassigned Time: Please list and provide rationale for requested reassign time.

SECTION 3: LEARNING OUTCOMES ASSESSMENT SUMMARY

3A. Attach 2014-2015 Course-Level Outcomes: Four Column Report for CL-SLO Assessment from TracDat. Please contact the Office of Instruction to assist you with this step if needed.

3B. Attach 2014-2015 Program-Level Outcomes: Four Column Report for PL-SLO Assessment from TracDat. Please contact the Office of Instruction to assist you with this step if needed.

SECTION 4: FEEDBACK AND FOLLOW-UP

This section is for the Dean/Supervising Administrator to provide feedback.

4A. Strengths and successes of the program as evidenced by the data and analysis:

The Physics & Engineering Departments are an extremely collegial, hard-working, and highly productive

group of faculty and staff. Their dedication to student success and outreach is of the highest order. Enrollment growth in physics (5%) and engineering (72%) is evidence of the high program quality and caliber of outreach events. Success rates in both the engineering department (84% average over 3 years) and the physics department (71%) exceed that of the greater PSME Division (65%) and the institutional standard (55%). Noteworthy is the high success rate of students in targeted groups in both departments, 61% and 73%, for physics and engineering, respectively.

The continuing success of the Physics Show is incredible and its reputation is known throughout the area. The multiple hours of work and dedication by the faculty and staff make this event a success year after year and should be applauded loudly.

Also noteworthy is the leadership the faculty take in a variety of activities that support both students and faculty members, such as the Women in STEM workshop, enrolling in a gender communications class, STEM Day, Physics Olympics, STEM Showcase, STEM Newsletter, AMATYC, etc. The Physics & Engineering Departments are a tireless, dedicated group of faculty that generate benefits for both the Division and College.

4B. Areas of concern, if any:

The primary area of concern is the availability of qualified and talented part-time faculty to staff physics and engineering courses. In the Fall 2015 Quarter, advertising for new part-time faculty was expanded to LinkedIN among other efforts. A few candidate inquiries were generated; however, there still remains a very small pool of individuals who possess the skills to teach effectively. Although the anticipated hiring of a new full-time physics faculty member will partially alleviate the situation, with current enrollment growth and anticipated professional leaves of full-time faculty, this remains a constant concern.

4C. Recommendations for improvement:

One recommendation is to expand advertising efforts beyond the District HR website and LinkedIN to attract additional part-time faculty to both Departments. This can be done in concert with the Marketing Department as well as HR to reach out to professional magazines, conferences, as well as local graduate schools.

With regards to the request for lab equipment requiring non-Lottery funding, the departments should prioritize which items it would most like purchased in the near term in order to provide guidance to OPC. Materials that can be purchased using Lottery funding can be discussed with the Dean, and if needed, the VP of Finance.

Since the Physics and Engineering Faculty have demonstrated a strong commitment to recruiting and retaining students in STEM majors, and have been successful with implementing multiple programs, additional funding to expand STEM Community Building initiatives should be seriously considered. This funding can come from both institutional and grant sources.

4D. Recommended Next Steps:

☒ Proceed as Planned on Program Review Schedule
☐ Further Review / Out-of-Cycle In-Depth Review

Upon completion of Section 4, the Program Review document should be returned to department faculty/staff for review, then submitted to the Office of Instruction and Institutional Research for public posting. Please refer to the Program Review timeline.

Unit Course Assessment Report - Four Column

Foothill College

Department - Physics (PHYS)

Mission Statement: The mission of the Physics department is to provide undergraduate education founded on a rigorous, applied treatment of physics? fundamentals coupled with experiential experiences and a broad commitment to generate and disseminate knowledge.

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Physics (PHYS) - PHYS 100 - PHYSICS STUDENT ASSISTANCE - Numerical Problems - The students will be able to use analysis to set up and solve numerical problems. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active			
Department - Physics (PHYS) - PHYS 100 - PHYSICS STUDENT ASSISTANCE - Skill Development - Student will spend the appropriate amount of time in PSME Center working on skills. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active			
Department - Physics (PHYS) - PHYS 100X - PHYSICS STUDENT ASSISTANCE - Numerical Problems - The students will be able to use analysis to set up and solve numerical problems (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active			
Department - Physics (PHYS) - PHYS 100X - PHYSICS STUDENT ASSISTANCE - Skill Development - Student will spend the appropriate amount of time in PSME Center working on skills. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:**			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Active			
Department - Physics (PHYS) - PHYS 100Y - PHYSICS STUDENT ASSISTANCE - Numerical Problems - The students will be able to use analysis to set up and solve numerical problems. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active			
Department - Physics (PHYS) - PHYS 100Y - PHYSICS STUDENT ASSISTANCE - Skill Development - Student will spend the appropriate amount of time in PSME Center working on skills. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active			
Department - Physics (PHYS) - PHYS 12 - INTRODUCTION TO MODERN PHYSICS - Reflecting on Physics 12 - 1. Students will understand their objectives for taking this course 2. Students will, when the course is over, reflect on how well the course met their objectives (Created By Department - Physics (PHYS)) **Start Date:** 12/01/2010 **End Date:** 06/30/2011 **Course-Level SLO Status:** Active	**Assessment Method:** Students received a survey on the first day of the class and then received another survey (based on the first) on the last day of the class. Students were asked to reflect on their objectives and how well the course met them. **Assessment Method Type:** Survey **Target for Success:** The majority of students in the class report that the class met the objectives which they had set.		
Department - Physics (PHYS) - PHYS 12 - INTRODUCTION TO MODERN PHYSICS - Understanding Relativity - Students will demonstrate an understanding of how Einstein's theories of relativity changed our understanding (through measurables) of	**Assessment Method:** Exam questions on both the quizzes and exams in Physics 12 will probe students' understanding of the ideas of relativity and ask students to apply this understanding to new situations.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
space, time, and mass. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** Students should be able to answer a majority of these questions successfully (keeping in mind, however, that these are tricky concepts, and even the best students may not get all questions right.)		
Department - Physics (PHYS) - PHYS 27 - COOKING THE EARTH - Critical Thinking – Cause and Effect - Students should be able to demonstrate their understanding of the relationship between greenhouse gasses and climate change. Students should be able to demonstrate their understanding of the relationship between climate change effects (changes in temperature, etc.) and ecosystems. (Created By Department - Physics (PHYS)) **Assessment Cycles:** End of Academic Year **Course-Level SLO Status:** Active	**Assessment Method:** This SLO will be assessed by either an in class exam question(s) or an assignment. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students demonstrate their understanding through mastery of the assignment by earning a B or better.		
Department - Physics (PHYS) - PHYS 27 - COOKING THE EARTH - Computation – Graph Reading - Students should be able to demonstrate their ability to interpret scientific data from a graph and understand the meaning of the data. (Created By Department - Physics (PHYS)) **Assessment Cycles:** End of Academic Year **Course-Level SLO Status:** Active	**Assessment Method:** This SLO will be assessed by either an in class exam question(s) or an assignment. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students demonstrate their ability to interpret and understand scientific data through earning a B or better on the assessment.		
Department - Physics (PHYS) - PHYS 2A - GENERAL PHYSICS - Kinematics, Newton's Laws, Energy, and Momentum - Students should be able to solve problems involving	**Assessment Method:** Students will be pre and post-tested with the Mechanics Baseline Test, a standardized test from the Physics Education Reseach	09/01/2015 - We used the FCI, which is also an industry-standard assessment with a similar scoring profile to the MBT. We found a normailized gain of 0.41, which is both well above	09/01/2015 - We should continue to look at the difference in pre-test means for the people who dropped

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Kinematics, Newton's Laws, Energy, and Momentum, and know when to use which concept. (Created By Department - Physics (PHYS))	community. **Assessment Method Type:** Exam - Standardized **Target for Success:** The class should show an improvement of 0.2 as measured by a normalized gain. This is the national average for physics courses.	the national average and many of our previous results. This number is somewhat skewed as this class had higher than normal attrition, which tends to give gain a bump (lower achieving students are not in the post-test sample). Also noted was that the average pre-test score for someone who completed the class was 12.7, as opposed to 10.7 for someone who dropped. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** We would like to keep class sizes to single-lab-lectures for 2A.	and the people who stayed, in order to see if this can be used as part of an early alert system.
Department - Physics (PHYS) - PHYS 2A - GENERAL PHYSICS - Lab Experiments - Via lab experiments, students will have an understanding of the background science, error analysis, and how to perform experiments. (Created By Department - Physics (PHYS))	**Assessment Method:** Instructors will examine an experiment with an eye towards major revision. **Assessment Method Type:** Departmental Questions **Target for Success:** Instructors should be satisfied that implementation of lab revision will lead to improved student understanding in lab. These improvements should also reflect current best practices in pedagogy.		
Department - Physics (PHYS) - PHYS 2AM - GENERAL PHYSICS - CALCULUS SUPPLEMENT - Derivatives in Mechanics - The student will be able to apply derivatives to problems in kinematics, dynamics, energy, momentum and related topics (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Roughly half of the problems on the final exam should involve taking derivatives to solve physics problems. Instructor will examine results. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% Success rate on these problems.	08/31/2015 - Students performed well on this task. They did a good job of connecting physics with the correct previous math experience. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** None. **Resource Request:** None.	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Physics (PHYS) - PHYS 2AM - GENERAL PHYSICS - CALCULUS SUPPLEMENT - Integrals in Mechanics - The student will be able to apply integrals to problems in kinematics, dynamics, energy, momentum and related topics. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Roughly half of the problems on the final exam should involve taking integrals to solve physics problems. Instructor will examine results. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% success on the integral problems.	08/31/2015 - The students also performed well on these problems. They have mastered this material. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** None	
Department - Physics (PHYS) - PHYS 2AM - GENERAL PHYSICS - CALCULUS SUPPLEMENT - Simple Second-order Differential Equations - The student will be able to solve introductory second-order differential equations. (Created By Department - Physics (PHYS))			
Department - Physics (PHYS) - PHYS 2B - GENERAL PHYSICS - Concepts in E&M - Students should be able to solve problems involving the relationships between charges, forces and fields for both electricity and magnetism, the concept of voltage, and simple circuits. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will be pre- and post-tested using a standardized exam. **Assessment Method Type:** Exam - Standardized **Target for Success:** The class should show an improvement of 0.2 as measured by a normalized gain. This is the national average for physics courses.	09/01/2015 - We pre and posted tested for a result of .39, in a small sample size. This result is not surprising as small classes thrive in our peer-interaction environment. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** We have no requests specifically for 2B.	09/01/2015 - We wish to upgrade the assessment tool to get a better view of student success.
Department - Physics (PHYS) - PHYS 2B - GENERAL PHYSICS - Thermodynamics - Students should understand the following concepts from Thermodynamics: 1. Distinctions between temperature, heat and energy. 2. PV diagrams 3. First and Second Laws of	**Assessment Method:** Students will be pre- and post-tested with a standardized exam. **Target for Success:** The class should show an improvement of 0.2 as measured by a normalized gain. This is the national average for physics courses.	09/01/2015 - We pre and posted tested for a result of .39, in a small sample size. This result is not surprising as small classes thrive in our peer-interaction environment. **Result:** Target Met **Year This Assessment Occurred:**	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Thermodynamics (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active		2014-2015	
Department - Physics (PHYS) - PHYS 2B - GENERAL PHYSICS - Lab Experiments - Lab experiments should teach students the background science, error analysis, and how to perform experiments. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Either via examination of lab books or in class observation, instructors should evaluate labs for improvement. **Assessment Method Type:** Essay/Journal		
Department - Physics (PHYS) - PHYS 2BM - GENERAL PHYSICS - CALCULUS SUPPLEMENT - Electric Fields via Calculus - The student will be able to apply the methods of calculus to calculate electric fields and potentials from charge distributions. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Instructor will have a question on the final exam to probe students' knowledge of the topic. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of students should make significant progress on this exam problem.	08/31/2015 - While most students do well on this, some struggle. We should have more sample problems showing how to perform these calculations. **Result:** Target Not Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** None. **Resource Request:** None.	
Department - Physics (PHYS) - PHYS 2BM - GENERAL PHYSICS - CALCULUS SUPPLEMENT - Gauss's Law and Ampere's Law - The student will be able to apply the methods of calculus to calculate electric and magnetic fields for the appropriate symmetric distributions. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Instructor will have one or more questions on the final exam to probe students' knowledge of the topic. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 80% of students should make significant progress on this problem.	08/31/2015 - Studets showed strong performance in this area, as it is put front and center in the course. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015	
Department - Physics (PHYS) - PHYS 2BM - GENERAL PHYSICS - CALCULUS SUPPLEMENT - Faraday's Law and	**Assessment Method:** Instructor will have one or more questions on the final exam to probe students'	08/31/2015 - Students did well on this question, but the instructor should design better problems to	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Corrected Ampere's Law - The student will be able to apply the methods of calculus to solve for the electric/magnetic fields generated from changing electric/magnetic fields. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	knowledge of the topic. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 80% of students should make significant progress on the problem(s).	make sure that there is both an conceptual and computational aspect to this. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015	
Department - Physics (PHYS) - PHYS 2BM - GENERAL PHYSICS - CALCULUS SUPPLEMENT - Time Behavior of RC, LR, RL and LRC circuits - The student will be able to apply the methods of calculus to solve problems in circuits with time-varying behavior. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Instructor will have a question on the final exam to probe students' knowledge of the topic. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 80% of students should make significant progress on this problem.	08/31/2015 - Students were able to meet this requirement. There is a good video that lays out the basics and this seems to get the point across to the online students. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015	
Department - Physics (PHYS) - PHYS 2C - GENERAL PHYSICS - Waves - Students should demonstrate competence in waves, including: Sound E&M Waves Interference (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** A standardized exam will be used. **Assessment Method Type:** Exam - Standardized	09/01/2015 - Students had a normalized gain of 0.21 (barely over target of 0.2), which was lower than the gains we saw in the other Physics 2 classes. It has been several years since this class was taught by a full-time instructor. Perhaps this class and the assessment need to have a stronger look from the FT instructors to make sure that the material and expectations are properly aligned. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** FT availabilty for 2C, which has been an ongoing resource allocation issue. Hopefully the addition of a new FT will help address this issue.	
Department - Physics (PHYS) - PHYS 2C - GENERAL PHYSICS - Optics - Students should demonstrate competence in optics,	**Assessment Method:** A standardized exam will be used. **Assessment Method Type:**		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
including: Relection Refraction Lenses Mirrors (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	Exam - Course Test/Quiz		
Department - Physics (PHYS) - PHYS 2C - GENERAL PHYSICS - Modern Physics - Students should demonstrate competence in Modern Physics, including Special Relativity Wave Nature of Quantum Physics (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** A standardized exam will be used. **Assessment Method Type:** Exam - Course Test/Quiz		
Department - Physics (PHYS) - PHYS 2C - GENERAL PHYSICS - Lab Experiments - Labs experiments should teach the students the background science, error analysis and how to perform experiments. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Either by review of lab reports, in-class observation, or independent study, instructors should evaluate the lab experiments on an ongoing basis. **Assessment Method Type:** Essay/Journal		
Department - Physics (PHYS) - PHYS 2CM - GENERAL PHYSICS - CALCULUS SUPPLEMENT - Optics - The student will be able to interpret phenomena in Waves and Optics with a calculus treatment. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** There should be at least one problem on the final exam that pertains to optics. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of the class should be able to solve said problem(s).		
Department - Physics (PHYS) - PHYS 2CM - GENERAL PHYSICS - CALCULUS SUPPLEMENT - Modern Physics - The student will be able to solve problems in	**Assessment Method:** There should be problems on the final that pertain to radioactivity and/or simple quantum mechanics.	08/31/2015 - Students could solve the particle in a box, which is the bread-and-butter case. **Result:** Target Met	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Modern Physics involving calculus. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% should show a mathematical understanding of the exam problems presented.	**Year This Assessment Occurred:** 2014-2015	
Department - Physics (PHYS) - PHYS 2CM - GENERAL PHYSICS - CALCULUS SUPPLEMENT - Thermodynamics - The student will be able to solve problems in Thermodynamics involving calculus. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Inactive			
Department - Physics (PHYS) - PHYS 36 - SPECIAL PROJECTS IN PHYSICS - Topic Investigation - Students have a understanding of a topic investigated in class. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Performance at the Physics Show **Assessment Method Type:** Observation/Critique **Target for Success:** Students perform well at the Physics Show		
Department - Physics (PHYS) - PHYS 36 - SPECIAL PROJECTS IN PHYSICS - Communicate Understanding - Students can convey this understanding in written and/or oral form. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Observation of Physics Show performance. **Assessment Method Type:** Observation/Critique **Target for Success:** Students perform well at the Physics Show.		
Department - Physics (PHYS) - PHYS 36X - SPECIAL PROJECTS IN PHYSICS - Topic Investigation - Students have a understanding of a topic investigated in class. (Created By Department - Physics (PHYS))			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Course-Level SLO Status: Active			
Department - Physics (PHYS) - PHYS 36X - SPECIAL PROJECTS IN PHYSICS - Communicate Understanding - Students can convey this understanding in written and/or oral form. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active			
Department - Physics (PHYS) - PHYS 36Y - SPECIAL PROJECTS IN PHYSICS - Topic Investigation - Students have a understanding of a topic investigated in class. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active			
Department - Physics (PHYS) - PHYS 36Y - SPECIAL PROJECTS IN PHYSICS - Communicate Understanding - Students can convey this understanding in written and/or oral form. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active			
Department - Physics (PHYS) - PHYS 4A - GENERAL PHYSICS (CALCULUS) - Kinematics, Newton's Laws, Energy, and Momentum - Students should be able to solve problems involving Kinematics, Newton's Laws, Energy, and Momentum, and know when to use which concept. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will be pre- and post-tested with a standardized exam from the Physics Education literature. **Assessment Method Type:** Exam - Standardized **Target for Success:** The class should show an improvement of 0.2 as measured by a normalized gain. This is the national average for physics courses.	09/01/2015 - This class saw an improvement of 0.21 barely exceeding our target, and well below the gains we saw across the rest of the department. This was in a triple-lab section. The large-lecture format should be avoided in the interests of student success. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:**	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		Physics would like to start offering single-lecture Physics 4A classes to address success and retention. This will be a hit to productivity.	
Department - Physics (PHYS) - PHYS 4A - GENERAL PHYSICS (CALCULUS) - Lab Experiments - Via lab experiments, students will have an understanding of the background science, error analysis, and how to perform experiments. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Instructors will examine a lab for major revision/improvement. **Assessment Method Type:** Class/Lab Project **Target for Success:** Instructors should be satisfied that implementation of lab revision will lead to improved student understanding in lab. These improvements should also reflect current best practices in pedagogy.		
Department - Physics (PHYS) - PHYS 4B - GENERAL PHYSICS (CALCULUS) - Topics in Electricty and Magnetism - Upon completion of the course, students should be able to solve problems involving forces, fields and potentials created by stationary and moving charges, and basic electrical circuits. (Created By Department - Physics (PHYS))	**Assessment Method:** Students will be pre and post-tested with the Conceptual Survey in Electricity and Magnetism (TYC Physics Workshop Project). **Assessment Method Type:** Exam - Standardized **Target for Success:** The class should show an improvement of 0.2 as measured by a normalized gain. This is the national average for physics courses.	09/01/2015 - This class saw an improvement of 0.42, a strong showing. We believe this performance is due to our peer-instruction environment. This model should be encouraged across the department. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** No specific requests for Physics 4B.	
Department - Physics (PHYS) - PHYS 4B - GENERAL PHYSICS (CALCULUS) - E&M Lab Experiments - Lab experiments should teach students the background science, error analysis, and how to perform experiments. (Created By Department - Physics (PHYS))	**Assessment Method:** Either by review of lab reports, in-class observation, or independent study, instructors should evaluate the lab experiments on an ongoing basis. **Assessment Method Type:** Essay/Journal		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Physics (PHYS) - PHYS 4C - GENERAL PHYSICS (CALCULUS) - Wave Concepts - Students should understand the following concepts about waves: 1. wave motion and energy transport by waves, 2. reflection and transmission, interference and standing waves, 3. intensity of sound and interference of sound 4. Doppler effect (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will be tested twice, once in midterm, once in final in Mechanical waves. **Assessment Method Type:** Exam - Course Test/Quiz	10/09/2015 - Students are getting better on individual midterms, (77%), but not as good in final (63%). Conceptual discussions improves students understanding the concepts, but problem solve is still a challenge for many of them. One evidence that students don't have enough exercise on problem solving is the homework quiz. The average score is 72% which should have been over 80% since the nature of the quiz is basically a duplicate of homework problem assigned. I am adding the number of examples on problem solving in class to help students getting better on problem solving skills. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015	
Department - Physics (PHYS) - PHYS 4C - GENERAL PHYSICS (CALCULUS) - Thermal Physics - Students should understand the following concepts Thermal physics: 1. Temperature, internal energy and heat transfer 2. Specific heat and Calorimetry 3. Zeroth, first, and second law of thermodynamics 4. Thermal processes and heat engines Students will articulate how thermodynamic principles affect real-world phenomena or students will be able to identify natural phenomena that are affected by heat and appraise how thermodynamic changes will affect natural systems (Created By Department - Physics (PHYS))	**Assessment Method:** Students will be tested twice, once in midterm, once in final exam. **Assessment Method Type:** Exam - Course Test/Quiz		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Course-Level SLO Status: Active			
Department - Physics (PHYS) - PHYS 4C - GENERAL PHYSICS (CALCULUS) - Optics - Students should understand the following concepts about optics: 1. Index of refraction and Snell's law 2. Image formed by reflection and refraction 3. Thin lens and lens maker equation 4. Optical instruments 5. Interference in Young's double slit experiment and thin film 6. Single slit diffraction and limits of resolution (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Students will be tested twice, once in midterm, once in final in Mechanical waves. **Assessment Method Type:** Exam - Course Test/Quiz		
Department - Physics (PHYS) - PHYS 4D - GENERAL PHYSICS (CALCULUS) - Einstein's Theory - Students should have both a conceptual and computational understanding of Einstein's theory of special relativity. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** A midterm will be devoted to special relativity, as well a problem on the final. Conclusions will be drawn from students' performance. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** At least 80% of the students should be able to solve simple problems such as length contraction or time dilation, and 80% should be able to solve paradoxes at the level of the Twin Paradox.	08/31/2015 - Students performed well this year on problems involving both relativistic collisions and velocity addition, two of the more difficult concepts. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** None	
Department - Physics (PHYS) - PHYS 4D - GENERAL PHYSICS (CALCULUS) - Schrodinger Equation - Students should have an understanding of the Schrodinger Equation and be able to solve problems with introductory-level potentials. (Created By Department - Physics (PHYS))	**Assessment Method:** A midterm will be devoted to the Schrodinger Equation, as will a problem on the final. Conclusions will be drawn from students' performance. **Assessment Method Type:** Exam - Course Test/Quiz	08/31/2015 - Students performed well at a basic level, but struggled with the concept of degeneracy, which was done at a fast pace in lecture. Degeneracy should be covered more deeply in future years. **Result:** Target Met **Year This Assessment Occurred:**	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Course-Level SLO Status: Active		2014-2015 **Resource Request:** None.	
Department - Physics (PHYS) - PHYS 4D - GENERAL PHYSICS (CALCULUS) - Lab Experiments - The lab experiments should give students deeper understanding into the historical experiments that form the basis of modern physics and the science involved. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** The lab reports from one of the experiments will be scrutinized with the goal of revising the experiment. **Assessment Method Type:** Essay/Journal	08/31/2015 - While the e/m redux experiment is a good look at returning to a previous experiment, in the future we'll be doing that through 4A (and perhaps more) labs, and should be able to remove this one from the 4D curricula, with replacement by something from another part of 4D. It is possible that we will expand out the radioactivity labs into three weeks, as they tend to be rushed. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** There are no major purchases being considered at this point, but there are constant small costs in terms of replacement, repairs and incremental upgrades. Physics should have an established year-to-year ongoing lab budget.	
Department - Physics (PHYS) - PHYS 54H - HONORS INSTITUTE SEMINAR IN PHYSICS - Physical/Conceptual Understanding - Students have a physical/conceptual understanding of a topic investigated in class. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** As this class is a seminar, the students will share their knowledge via in-class discussion, evaluated by the instructor. **Assessment Method Type:** Discussion/Participation	08/31/2015 - This class was a projects-based seminar, and the instructor was impressed by the level of collaboration and cross-pollination between the different groups. This was a strong batch of students, and they supported each other in their understanding. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015	
Department - Physics (PHYS) - PHYS 54H - HONORS INSTITUTE SEMINAR IN	**Assessment Method:** As this class is a seminar, the students will		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
PHYSICS - Mathematical Understanding - Students have a mathematical understanding of a topic investigated in class. (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	share their knowledge via in-class discussion, evaluated by the instructor. **Assessment Method Type:** Discussion/Participation		
Department - Physics (PHYS) - PHYS 6 - INTRODUCTORY PHYSICS - Kinematics, Newton's Laws, Energy, and Momentum - Students should understand the following basic concepts from mechanics: Kinematics, Newton's Laws, Energy, and Momentum (Created By Department - Physics (PHYS)) **Course-Level SLO Status:** Active	**Assessment Method:** Students' midterm and final exam will be compared to analyze their understanding on Newton's second Law. **Assessment Method Type:** Exam - Course Test/Quiz	10/09/2015 - I have not changed anything for the fall 2014 and summer 2015. Posting discussion topics counting it as part of students' grade seems to work as nicely as last year. There were more discussion topics that from students in addition to discuss the topics that I posted. I found that the people who were very actively participating the discussions are not likely to withdraw. Students have better grasp of Newton's Law in theory (70% for the fall 2014, and 85% for summer 2015), but still have difficult time with application of Newton's Law (65% for the fall 2014, and 79% for the summer 2015). I am planning on making videos for this class on some of the most difficult topics and problems solving. Hopefully that will help students on understanding the topics better. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** None	
Department - Physics (PHYS) - PHYS 6 - INTRODUCTORY PHYSICS - Basic Concepts - Students should understand the following basic concepts from Electricity: Charges, electric forces and electric field. (Created By Department - Physics (PHYS))	**Assessment Method:** The class will be given a pre-lecture test and post lecture test within their final exam to analyze their understanding of electric charges, and electric forces.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Course-Level SLO Status: Active	**Assessment Method Type:** Exam - Course Test/Quiz		

Unit Assessment Report - Four Column

Foothill College

Program (PSME - PHYS) - Physics AS

Primary Core Mission: Transfer

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Program (PSME - PHYS) - Physics AS - Problem Solving - Upon completion of the AS degree, students will demonstrate the ability to apply the laws of physics to word problems, properly manipulating basic mathematical formulae to arrive at the correct answers. **SLO Status:** Active	**Assessment Method:** Problems on the midterm(s) and final exam will be examined to verify that the students are properly solving physics problems. This assessment will be performed in Physics 4D. **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 90% of students should meet a level satisfactory to the examiner.	08/31/2015 - At the end of the sequence, physics students are able to take questions posed with information made up of both relevant and irrelevant data, select out what they need, and use that to solve multi-step problems. These students are ready for advanced work at four-years. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** We need additional faculty in order to meet enrollment demands. **Resource Request:** We need additional faculty in order to meet enrollment demands.	
Program (PSME - PHYS) - Physics AS - Communication of Scientific Results - Upon completion of the AS degree, students will demonstrate the ability to effectively communicate physics by crafting written lab reports and/or giving oral presentations. **SLO Status:** Active	**Assessment Method:** In the case of written communication, student lab reports will be evaluated against a rubric. For oral presentations, students shall deliver a mini-lecture to the class. This assessment will be performed in Physics 4D. **Assessment Method Type:** Portfolio Review **Target:** 90% of students should show mastery.	08/31/2015 - For the second year, a week's worth of labs was cancelled for one-on-one writing workshops. This lead to strong lab reports by most students, although some still struggle written English. Oral reports were good, but again some struggled with English. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015	08/31/2015 - Again, it would be worthwhile to explore supports for written English, perhaps in the PSME Center? This may be problematic, as it would duplicate other services. For oral reports we should develop a peer-reviewed rubric so students have a better idea of expectations as a deeper level of accountability.
Program (PSME - PHYS) - Physics AS - Lab Skills - Upon completion of the AS degree, students will demonstrate mastery	**Assessment Method:** Students will be observed in lab by the instructor for use of lab equipment, lab	08/31/2015 - Again, students had a large disparity in their sophistication around error analysis at the start, but these were rectified prior to completion.	08/31/2015 - Physics 6 is not the appropriate place for error analysis, both because not everyone takes it,

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
of lower-level lab skills such as proper use of standard lab equipment and proper application of data analysis. **SLO Status:** Active	reports will be examined for mastery of data analysis. This assessment will be performed in Physics 4D. **Assessment Method Type:** Class/Lab Project **Target:** 90% of students should demonstrate mastery.	Overall labs skills were excellent. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** Support should be given for reform of labs, perhaps in the form of release time. **Resource Request:** Support should be given for reform of labs, perhaps in the form of release time. Lab purchases should come from an ongoing dedicated budget.	and it has no lab component. Instead, we are starting to reform our labs, starting with 4A. This is being done in conjunction with a Physics Education Research group at a local R1. If successful, we can bootstrap from those labs to the rest of our experiments. This may involve some costs in terms of release time and equipment.

Unit Course Assessment Report - Four Column

Foothill College

Department - Engineering (ENGR)

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Engineering (ENGR) - ENGR 10 - INTRODUCTION TO ENGINEERING - Engineering Commuication - Communicate effectively through written documents and oral presentations (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** Oral presentation to the class on the design project. **Assessment Method Type:** Presentation/Performance **Target for Success:** 90% of the class shows improvement in oral communication skills between the first and last oral presentations.		
Department - Engineering (ENGR) - ENGR 10 - INTRODUCTION TO ENGINEERING - Engineering Problem Solving - Identify, formulate and solve problems that have real world constraints (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** Formal report from the design project. **Assessment Method Type:** Class/Lab Project **Target for Success:** 75% of the class will receive a B or better on the design project report.		
Department - Engineering (ENGR) - ENGR 10 - INTRODUCTION TO ENGINEERING - Engineering Process - Work as a contributing member of a functional team (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** Peer survey. Survey completed by team members at the end of the project. **Assessment Method Type:** Survey **Target for Success:** 80% of the class being rated as "Satisfactory" or better by their team members.		
Department - Engineering (ENGR) - ENGR 10 - INTRODUCTION TO ENGINEERING - Application of Knowledge - An ability to apply knowledge of mathematics, science and engineering. (Created By Department - Engineering (ENGR))			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Course-Level SLO Status: Inactive			
Department - Engineering (ENGR) - ENGR 10 - INTRODUCTION TO ENGINEERING - Complex Problem Solving - Collaborative skills to solve complex problems via verbal communication, writing and presentation in a structured format. (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Inactive			
Department - Engineering (ENGR) - ENGR 102 - BUILDING SCIENCE & PERFORMANCE ENGINEERING - Energy efficiency measures - Articulate to key building stakeholders' current building energy use, appropriate energy efficiency measures, and the potential for energy and economic savings (Created By Department - Engineering (ENGR)) **Start Date:** 04/01/2012 **End Date:** 06/30/2012 **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 102 - BUILDING SCIENCE & PERFORMANCE ENGINEERING - Energy auditing techniques - Perform energy auditing techniques, energy use analysis, including benchmarking, in the commissioning or renovation of new and existing buildings (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Inactive			
Department - Engineering (ENGR) - ENGR			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
102 - BUILDING SCIENCE & PERFORMANCE ENGINEERING - Upgrade and replace HVAC, lighting and glazing - Develop engineering approaches and economic strategies for upgrading or replacing HVAC, lighting, glazing, applying pertinent energy codes and building standards (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Inactive			
Department - Engineering (ENGR) - ENGR 102 - BUILDING SCIENCE & PERFORMANCE ENGINEERING - Analyze and apply onsite PV (BIPV) - Analyze the economics of on-site photovoltaic and other alternate energy systems (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Inactive			
Department - Engineering (ENGR) - ENGR 102 - BUILDING SCIENCE & PERFORMANCE ENGINEERING - Zero Net Energy Buildings - Use modeling tools to diagram potential approaches to zero net energy buildings (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Inactive			
Department - Engineering (ENGR) - ENGR 11 - PROGRAMMING & PROBLEM SOLVING IN MATLAB - Numerical Methods - Students who successfully complete this course should be able to demonstrate knowledge and skills about numerical methods. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Academic Year	**Assessment Method:** 75% of the students taking the final exam should get a C or better on the final exam. **Assessment Method Type:** Exam - Course Test/Quiz		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Course-Level SLO Status: Active			
Department - Engineering (ENGR) - ENGR 11 - PROGRAMMING & PROBLEM SOLVING IN MATLAB - Matlab programming - Students who successfully complete this course should be able to write programs using Matlab to implement problem solving algorithms. (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** 70% of the students turning in projects should earn a C or better **Assessment Method Type:** Class/Lab Project		
Department - Engineering (ENGR) - ENGR 25 - FRESH WATER PROCESS - basic calculations - Be able to do basic calculations related to water quantity, flow, and energy generation from hydropower (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 25 - FRESH WATER PROCESS - policy on water - Have greater insight into how water policy is made and implemented (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 25 - FRESH WATER PROCESS - water sector - Be introduced to cost, financing, and rate-making challenges in the water sector (Created By Department -			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Engineering (ENGR)) **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 25 - FRESH WATER PROCESS - problem solving - Have practice breaking a complex water problem into important parts, studying the parts, and then reconnecting the parts to better understand the entire problem (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 25 - FRESH WATER PROCESS - water issues - Be knowledgeable about important water issues in California and beyond (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 28 - AN INTRODUCTION TO BIOENGINEERING - Career Paths - The student will be able to describe the bioengineering industry and identify the available career opportunities applicable to their personal career goals. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active	**Assessment Method:** The SLO will be assessed by a written assignment involving a personal career plan **Assessment Method Type:** Essay/Journal **Target for Success:** 80% of students will have identified a potential career path in bioengineering suited to their interests by the end of the course		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Engineering (ENGR) - ENGR 28 - AN INTRODUCTION TO BIOENGINEERING - Biology Foundation - The student will be able to define and describe the fundamentals of molecular biology as they pertain to bioengineering including, but not limited to, nucleic acid and protein structure, the human genome, and cell biology. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active	**Assessment Method:** The SLO will be assessed by either an in class exam question(s) or an assignment **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students will achieve a B grade or higher on this assignment/exam.		
Department - Engineering (ENGR) - ENGR 28 - AN INTRODUCTION TO BIOENGINEERING - Physical Systems Foundation - The student will be able to analyze the physical processes associated with common biological systems and emonstrate how conservation laws (including conservation of mass and energy, momentum, and charge) apply to biological and medical systems. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active	**Assessment Method:** The SLO will be assessed by either an inclass exam question(s) or an assignment **Assessment Method Type:** Exam - Course Test/Quiz		
Department - Engineering (ENGR) - ENGR 28 - AN INTRODUCTION TO BIOENGINEERING - Applications - The student will be able to recognize and discuss current applications of bioengineering and the relevant steps of the bioengineering design process in medicine, agriculture, and technology. (Created By Department - Engineering (ENGR))	**Assessment Method:** The SLO will be assessed by either an inclass exam question(s) or an assignment. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of students will achieve a B or better on this assignment/exam		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Assessment Cycles: End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 35 - STATICS - Particles and Rigid Bodies - The student be able to determine the equilibrium of particles and rigid bodies in two and three dimensions (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** Final exam **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 70% students can use principle of equilibrium to analyze particles and rigid bodies correctly.		
Department - Engineering (ENGR) - ENGR 35 - STATICS - Forces, Centroid and Moments of Inertia - The student will be able to analyze the forces, centroid and moments of inertia on structures, such as: - Trusses - Frames - Beams - Cables (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** End of quarter project **Assessment Method Type:** Class/Lab Project **Target for Success:** 90% of students should apply structure analysis to their end of quarter project by building bridge structure that take specified load.		
Department - Engineering (ENGR) - ENGR 36 - SPECIAL PROJECTS IN ENGINEERING & TECHNOLOGY - E36-Special project - Students should be able to demonstrate improved hands-on skill in carrying out their project. (Created By Department - Engineering (ENGR))	**Assessment Method:** evaluate final project **Assessment Method Type:** Observation/Critique		
Department - Engineering (ENGR) - ENGR 37 - INTRODUCTION TO CIRCUIT ANALYSIS - Direct and Alternating Current - Students will correctly identify the production, characteristics, applications, and	**Assessment Method:** comparing student exam from quizzes, exams and final exam to monitor student progress. **Assessment Method Type:**		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
voltage change methods of Direct Current and Alternating Current. (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	Exam - Course Test/Quiz **Target for Success:** 75% of student understand and master the concept.		
Department - Engineering (ENGR) - ENGR 37 - INTRODUCTION TO CIRCUIT ANALYSIS - Quantities of DC and AC Circuits - Students will correctly calculate quantities in DC and AC circuits containing resistive devices,capacitors, and inductors using Ohm?s and Watt?s Laws, Kirchoff?s Laws, and appropriate circuit analysis methods. (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** using exams to monitor student progress and understanding of the concepts mentioned in SLO **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students should master the ideas stated in SLO.		
Department - Engineering (ENGR) - ENGR 37 - INTRODUCTION TO CIRCUIT ANALYSIS - Laboratory Measurements - Students will correctly perform measurements using multimeters, oscilloscopes, and signal generators, perform circuit fabrication using electronic schematic diagrams, and perform simple problem-isolation techniques on laboratory circuits. (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Inactive			
Department - Engineering (ENGR) - ENGR 37L - CIRCUIT ANALYSIS LABORATORY - Circuit Analysis Laboratory - The student will be able to: a) make satisfactory measurements in circuits containing dc, ac and composite signals using equipment commonly found in	**Assessment Method:** Supervise students' work in lab session and monitor students' progress using equipment and making correct measurement. **Assessment Method Type:** Observation/Critique **Target for Success:** By end of the quarter, 100% of students		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
an electrical engineering laboratory. b) understand the effect of a measuring instrument on a circuit under test. analyze resulting error. (Created By Department - Engineering (ENGR)) **Start Date:** 04/09/2012 **Course-Level SLO Status:** Active	should be able to know how to use equipment and how to correctly making related measurement.		
Department - Engineering (ENGR) - ENGR 39 - ENERGY, SOCIETY, & THE ENVIRONMENT - Global Energy Situation - Learn about our global energy situation and relevant economic and environmental issues (Created By Department - Engineering (ENGR)) **Start Date:** 10/01/2012 **End Date:** 12/01/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Written essay and class discussions about how we got into the energy/climate predicament we are in, the types of energy used for types of activities (housing, commerce, industry, and transportation), and the environmental consequences of mining and extraction, processing, and combustion of fossil fuels. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students will be able to articulate well the linkage between economy => energy => climate, energy intensity of various activities, and projections for world energy demand based on population, wealth, and technology based activities.		
Department - Engineering (ENGR) - ENGR 39 - ENERGY, SOCIETY, & THE ENVIRONMENT - Clean energy technology - Understand clean energy technology, and policies and actions to accelerate positive change (Created By Department - Engineering (ENGR)) **Start Date:** 10/01/2012 **End Date:** 12/31/2012	**Assessment Method:** A broad overview question that has two parts, first the understanding of specific clean energy technology (solar, wind, geothermal), electric vehicles and fuel cells, energy efficiency and smart energy management, and policies, actions, and consumer choices (behaviors) and personal energy management to affect positive change. **Assessment Method Type:**		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Course-Level SLO Status: Active	Exam - Course Test/Quiz **Target for Success:** 90% or more of students should be able to describe the benefits of solar PV technology, wind, geothermal, electric vehicles, fuel cells, energy efficiency, and natural gas as a replacement for coal. 90% or more will be able describe three specific actions (consumer behaviors) and/or policies to accelerate both energy use and GHG emission reduction, such as renewable portfolio standards and low carbon fuel standards. Personal energy management/GHG goals would be a bonus.		
Department - Engineering (ENGR) - ENGR 39 - ENERGY, SOCIETY, & THE ENVIRONMENT - Measure and analyze energy use - Learn how to measure and analyze energy use in buildings, transportation, and apply tools and other behavioral changes to achieve goals in personal energy use and GHG emissions (Created By Department - Engineering (ENGR)) **Start Date:** 10/01/2012 **End Date:** 12/31/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Students will use Kill-a-watt meters, smart meter (online meter data management), utility bills, and commercial interval data (if available) to estimate energy use in buildings, and calculate building energy intensity. Students will track their mileage driving as well as gasoline intake to estimate petroleum emissions. Some students will use personal energy tools (including wattzon etc) to measure and manage their energy use and create personal climate action plans. **Assessment Method Type:** Class/Lab Project **Target for Success:** 75% or more of students will calculate accurate energy intensity of residence based on utility bills, and conduct a home energy audit of major appliances, correlated to smart meter (or other interval meter data). 75% will accurately know, or reasonable estimate, their use of petroleum and associated GHG emissions. Most students will articulate a personal energy management plan.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Engineering (ENGR) - ENGR 40 - INTRODUCTION TO CLEAN ENERGY TECHNOLOGY - Understand Modern Energy Systems - Students will develop a qualitative and quantitative understanding of modern energy systems, how energy technology has evolved over the last 150 years, and how it meets the needs of residential, commercial, industrial, and transportation. (Created By Department - Engineering (ENGR)) **Start Date:** 10/01/2011 **End Date:** 12/31/2011 **Course-Level SLO Status:** Active	**Assessment Method:** Through weekly questions students will show evidence of understanding of each topic, including descriptions of technology, numerical use of energy data, diagrams of energy technology, and use of figures to help explain energy concepts. **Assessment Method Type:** Departmental Questions **Target for Success:** The majority of students will show sufficient mastery of a topic to explain core ideas and concepts to peers, and use calculations, diagrams, etc. as a method of demonstrating engineering skills for each topic. Some weekly questions will build on previous work in the course, demonstrating cummulative learning about energy.	06/30/2015 - All students were able to master basic (and systems) level energy infrastructure, including analysis of local electrical power grid. Being able to explain the concepts (as well as make accurate diagrams) to others is part of our energy champions effort. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** N/A	
Department - Engineering (ENGR) - ENGR 40 - INTRODUCTION TO CLEAN ENERGY TECHNOLOGY - Understand economic - energy - environmental connection (IPAT) - Students will develop a quantitative understanding of the connection (correlation) between population, income, energy use, and environmental impact (IPAT). Students will apply IPAT by global/region, level of economic development, and extrapolate to 2030, and understand the imperitive for developing clean energy technology (Created By Department - Engineering (ENGR)) **Start Date:** 10/01/2011 **End Date:** 12/31/2011 **Course-Level SLO Status:** Active	**Assessment Method:** This is a midterm assignment where students will use a combination of the first SLO, understanding of modern energy systems, with IPAT, which combines knowledge of how economies are built on energy, and how economic growth leads to increased consumption through energy intensive activities. A key assessment finding is projection of economic growth through 2030, and how fossil fuels driving that growth will lead to unacceptable levels of greenhouse gas emissions. **Assessment Method Type:** Research Paper **Target for Success:** Compete assignments will show good numerical models for GHG emissions, tied to each sector of energy use, and regionally by economic development. The majority of	06/30/2015 - Students used the I=PAT equation effectively throughout the class, as this is the key reason we are in the current energy predicament we're in. There are numerical calculations around I=PAT that students have mastered as well (strategic planning). **Result:** Target Met **Year This Assessment Occurred:** 2014-2015	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	students will leave with a profound understanding of our dependence on fossil fuels, and a quantitative idea about how much clean energy technology needs to be developed by 2030.		
Department - Engineering (ENGR) - ENGR 40 - INTRODUCTION TO CLEAN ENERGY TECHNOLOGY - Application of Clean Energy Technology - Students will learn about clean energy technology for energy generation, distribution, commerce, industry, buildings, and transportation, and apply a specific technology to applications in each of these energy applications (Created By Department - Engineering (ENGR)) **Start Date:** 10/01/2011 **End Date:** 12/31/2011 **Course-Level SLO Status:** Active	**Assessment Method:** Through a combination of a class lab project with an accompaning research paper, students will apply a number of clean energy technologies to a specific application of energy use, such as energy generation, distribution, buildings, transportation, using compelling engineering descriptions in text, using calculations, diagrams and figures, and persuasive oral presentation. **Assessment Method Type:** Class/Lab Project **Target for Success:** The majority of students will find good applications of clean energy for needs in commerce, industry, buildings, and transportation.	06/30/2015 - This is a complicated SLO as it includes most of the energy infrastructure involving renewable energy, smart grid/energy, high performance buildings, electric vehicles and transportation, advanced biofuels, etc. In a class that meets twice a week there's more time to cover the systems integration of these technologies. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015 **Resource Request:** N/A	
Department - Engineering (ENGR) - ENGR 45 - PROPERTIES OF MATERIALS - Classess of Materials - To ensure that our students are knowledgeable about all classes of materials and their structure, properties, processing, applications and performance; (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** Students performance will be scored by answering questions on the final exam. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 80% of the students taking the exam getting a B or better.		
Department - Engineering (ENGR) - ENGR 45 - PROPERTIES OF MATERIALS - Real Materials engineering Problems - To ensure that our students can properly relate their hands-on laboratory experiences to solving	**Assessment Method:** Students will be assessed by their average performance on laboratory projects for the quarter. **Assessment Method Type:**		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
real materials engineering problems (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	Class/Lab Project **Target for Success:** 70% of the class scoring a B or better will be considered success.		
Department - Engineering (ENGR) - ENGR 46 - STRENGTH OF MATERIALS - Conceptual Understanding - Students who successfully complete this course should be able to demonstrate a conceptual understanding of the stresses and strains within materials and the ways in which they fail. (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** Students should be able to discuss the behavior of materials in a class presentation. **Assessment Method Type:** Class/Lab Project **Target for Success:** 70% of the class should give a successful presentation.		
Department - Engineering (ENGR) - ENGR 46 - STRENGTH OF MATERIALS - Application - Students who successfully complete this course should be able to carry out calculations regarding stresses and strains within materials. (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** 70% of the students taking the final exam should earn a grade of C or better. **Assessment Method Type:** Exam - Course Test/Quiz		
Department - Engineering (ENGR) - ENGR 47 - DYNAMICS - Computation - Students should be able to analyze kinematics of rigid bodies in three dimensions. (Created By Department - Engineering (ENGR)) **Start Date:** 09/22/2014 **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 47 - DYNAMICS - Modeling - Students should be able to model the relationship between forces and acceleration and energy			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
and momentum. (Created By Department - Engineering (ENGR)) **Start Date:** 09/22/2014 **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 49 - ENGINEERING PROFESSION - Self Analysis and Career Research - Identify one's interest in a engineer field(s) via self analysis and career research. (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** 3-10 page essay on career plan or poster on benefits of a particular engineering field or career **Assessment Method Type:** Class/Lab Project **Target for Success:** 85% of students receive a grade of B or better.		
Department - Engineering (ENGR) - ENGR 49 - ENGINEERING PROFESSION - Engineering Responsibilities - An understanding of professional, ethical, legal, security, and social issues and responsibilities (Created By Department - Engineering (ENGR)) **Course-Level SLO Status:** Active	**Assessment Method:** Class discussion on responsibilities in engineering. **Assessment Method Type:** Discussion/Participation **Target for Success:** 95% of the registered students contributing to the discussion.		
Department - Engineering (ENGR) - ENGR 54H - HONORS INSTITUTE SEMINAR IN ENGINEERING - Technical Communication - Students should be able to discuss the importance of their topic and explain the details of their topic in written form. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Academic Year **Course-Level SLO Status:** Active	**Assessment Method:** Each student should turn in a research paper at the culmination of the course. **Assessment Method Type:** Research Paper **Target for Success:** 75% of students should achieve an A on the research paper.		
Department - Engineering (ENGR) - ENGR 54H - HONORS INSTITUTE SEMINAR IN	**Assessment Method:** Students will discuss with the instructor their		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
ENGINEERING - Independent Analysis - Students should be able to demonstrate initiative in pursuing and analyzing the topic of interest. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Academic Year **Course-Level SLO Status:** Active	interests and plans for pursuing the topic of choice. **Assessment Method Type:** Discussion/Participation **Target for Success:** By the end of course, 100% of students demonstrate through discussions their interest and plans for research.		
Department - Engineering (ENGR) - ENGR 6 - ENGINEERING GRAPHICS - Sketching by hand - Students will be able to sketch orthographic drawings according to industry standards from a given object. (Created By Department - Engineering (ENGR))	**Assessment Method:** Assignment to sketch an orthographic drawing from an object. **Assessment Method Type:** Class/Lab Project **Target for Success:** 80% of the participating students will earn a B or better on the assessment		
Department - Engineering (ENGR) - ENGR 6 - ENGINEERING GRAPHICS - Computer Aided Design models - Students will be able to create 3-D models using CAD software that adhere to standards in design and manufacturing. (Created By Department - Engineering (ENGR))	**Assessment Method:** Assignment to create a 3D model of an object following industry standards for design and manufacturing. **Assessment Method Type:** Class/Lab Project **Target for Success:** 80% of participating students will receive a B or better on the 3D prototype created for the project.		
Department - Engineering (ENGR) - ENGR 62A - INTRODUCTION TO 3D PRINTING & RAPID PROTOTYPE DESIGN - Industry Awareness - Demonstrate knowledge of the 3D printing industry and its potential applications. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Course-Level SLO Status: Active			
Department - Engineering (ENGR) - ENGR 62A - INTRODUCTION TO 3D PRINTING & RAPID PROTOTYPE DESIGN - Tools of the Trade - Communicate the necessary technical skills and work requirements for the model making and design process. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 62A - INTRODUCTION TO 3D PRINTING & RAPID PROTOTYPE DESIGN - Career Possibilities - Analyze personal aptitudes and interests within the industry to identify career pathways and opportunities. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 62B - 3D PRINTING: BASIC MODEL MAKING - Drafting skills - Create three-dimensional sketches by drafting simple primitives and applying proper line conventions. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 62B - 3D PRINTING: BASIC MODEL			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
MAKING - Standards, specifications, and safety - Interpret and use industrial specifications and engineering standards for the safe selection and application of appropriate model making techniques and equipment. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 62B - 3D PRINTING: BASIC MODEL MAKING - Basic Models - Select proper materials to construct simple models and forms and justify selections. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 62C - 3D PRINTING: ADVANCED MODEL MAKING - Equipment Expertise - Demonstrate proficiency with a variety of 2D & 3D modeling equipment using clay, plastic resins, and metal casting. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 62C - 3D PRINTING: ADVANCED MODEL MAKING - Analysis of Models - Effectively create and analyze models and select proper materials and equipment for production. (Created By Department - Engineering (ENGR))			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Assessment Cycles: End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 62D - 3D RAPID MODEL MAKING & PROTOTYPE DEVELOPMENT - Fabrication Skills - Demonstrate proficiency in programming, setting-up, and operating a variety of 3D modeling machines to create complex parts. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 62D - 3D RAPID MODEL MAKING & PROTOTYPE DEVELOPMENT - Presentations - Perform comprehensive design solutions presentations. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 62D - 3D RAPID MODEL MAKING & PROTOTYPE DEVELOPMENT - Model analysis - Create and analyze computer generated models using advanced skills, techniques, and materials to produce high-quality parts. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:**			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Active Department - Engineering (ENGR) - ENGR 81 - ELECTRIC POWER SYSTEMS - Electrical concepts and measurements - Apply physics of electricity and magnetism to calculate, predict and safely measure basic properties of power systems. (Created By Department - Engineering (ENGR)) **Start Date:** 04/01/2012 **End Date:** 06/30/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Examination to require basic calculations in physics of electricity in circuits including motors, generators, large capacitor banks and distribution systems. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students will be successful in 75% of all calculations.		
Department - Engineering (ENGR) - ENGR 81 - ELECTRIC POWER SYSTEMS - Modern power systems - Describe and diagram a modern electric utility system, infrastructure, and power systems architecture (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Start Date:** 04/01/2012 **End Date:** 06/30/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Drawing and written explanation **Target for Success:** 75% of students will be able to describe/draw general components of a power system		
Department - Engineering (ENGR) - ENGR 81 - ELECTRIC POWER SYSTEMS - Distributed generation and smart energy systems - Apply power systems knowledge to distributed generation, active distribution, and smart energy management (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Start Date:**	**Assessment Method:** Students will submit a written assignment describing active distribution of power through a combination of energy storage, flexible energy generation, and addressable loads (active load management) **Assessment Method Type:** Essay/Journal **Target for Success:** 75% of students will score at 75% or better		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
04/01/2012 **End Date:** 06/30/2012 **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 82 - PHOTO VOLTAIC & SOLAR CELL DESIGN - Science of Photo Voltaics - Understand the basic science of solar photovoltaic technology and the primary technologies currently available (Created By Department - Engineering (ENGR)) **Start Date:** 04/01/2012 **End Date:** 06/30/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Use written explanations, diagrams, and class discussion to determine if the basic concepts of a photovoltaic junction/cell/module are understood, and various types of approaches to fabricating photovoltaic devices. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students will be able to explain the basic operation of a photovoltaic junction, and compare and contrast the approaches, advantages and disadvantages of using silicon, CdTe, CIGS, TiO2, and other materials.		
Department - Engineering (ENGR) - ENGR 82 - PHOTO VOLTAIC & SOLAR CELL DESIGN - Solar installation process - Understand how to assess, design, and construct a solar installation from fabrication to grid incorporation (Created By Department - Engineering (ENGR)) **Start Date:** 04/01/2012 **End Date:** 06/30/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Students will perform analysis of a basic photovoltaic installation including existing load, cost of current electricity, roof orientation, solar index, and available choices for installation (size) choice of panels, inverter, and balance of system. Assignment will include diagrams, spreadsheets, and supporting text. Students will describe the process of getting proper permits and interconnect. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students will display proficiency in this assignment, although the level of rigor can vary significantly in an assignment like this. Students may be allowed to work in		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
	groups, and also submit this assignment as part of a final project/class presentation.		
Department - Engineering (ENGR) - ENGR 82 - PHOTO VOLTAIC & SOLAR CELL DESIGN - Drivers and limitations of solar PV adoption - Be able to discuss the political, environmental, and economic motivations and limitations of solar energy use (Created By Department - Engineering (ENGR)) **Start Date:** 04/01/2012 **End Date:** 06/30/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Written assignment and possibly a class discussion about political drivers (and resistance) to adoption of large-scale solar, RPS (Renewable Portfolio Standards), environmental drivers (political and other), and economic drivers for solar PV development and deployment. Assignment can include calculations for estimating the amount of solar PV needed to reach carbon reduction targets. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% or more of students will articulate the political, environmental, and economic drivers for solar PV adoption, and be able to explain this to people outside of the class as a means of showing mastery and communicating the need for solar PV.		
Department - Engineering (ENGR) - ENGR 83 - SMART ENERGY SYSTEMS - Modernized Grid - Articulate the need for a modernized grid with a ?smart energy? intelligence layer (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Start Date:** 04/01/2012 **End Date:** 06/30/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Written description with examples and details of smart energy systems in a modern utility, addressing load and asset management, grid stress, and demand response. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students will be able to describe the need and application of smart energy as an intelligence and control layer in a modernized grid structure, including specific examples related to Renewable Energy, EV integration, energy storage, and smart buildings.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Engineering (ENGR) - ENGR 83 - SMART ENERGY SYSTEMS - Smart energy architecture - Describe and diagram the physical and logical architecture of smart energy systems (Created By Department - Engineering (ENGR)) **Start Date:** 04/01/2012 **End Date:** 06/30/2012 **Course-Level SLO Status:** Active	**Assessment Method:** Assignment could be a written essay with diagrams, class presentation, or part of a final exam. Students should combine diagrams with descriptions and explanations of how components of a smart energy system work together to provide insights into energy use (energy analytics) and active load management. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of students will be able to describe system architecture of a utility including advanced metering infrastructure, smart meters, meter data management, and elements of energy portals including ENERNOC (etc).		
Department - Engineering (ENGR) - ENGR 83 - SMART ENERGY SYSTEMS - Smart energy process - Describe and articulate the relations of stakeholders and smart energy process (Created By Department - Engineering (ENGR)) **Start Date:** 04/01/2012 **End Date:** 06/30/2012 **Course-Level SLO Status:** Active	**Assessment Method:** This is an essay style question that is somewhat open-ended as the the evolution of smart energy process, stakeholders, policy and business process is ongoing and unfolding. This is a reflective exercise that students can **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% or more of the class should be able to describe three key stakeholders in smart energy process, including end-user customers, local utilities, and larger transmission and distribution system operators. Other stakeholders include society (environmental and economic) including resource and GHG management.		

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Engineering (ENGR) - ENGR 83A - INTRODUCTION TO BIOMEDICAL ENGINEERING - Biological system components - Students who successfully complete this course should be able to identify basic components of biological systems and their functions. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 83A - INTRODUCTION TO BIOMEDICAL ENGINEERING - Developmental stages of biomedical product - Students who successfully complete this course should be able to explain how a new biomedical product moves through the following developmental states: prototype, testing, production, and marketing. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 83B - DESIGN AND MANUFACTURING IN THE BIOMEDICAL ENGINEERING FIELD - Product requirements - Students who successfully complete this course should be able to define product requirements based on customer needs. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:**	**Assessment Method:** The final exam questions - focusing on product design considerations and customer requirements - will be used as the assessment. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of the students taking the final exam scoring a B or better on the relevant exam questions.	04/25/2015 - 82% of the students taking the final exam scored B or better (getting 80% of the possible points) for the relevant questions. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015	

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Active			
Department - Engineering (ENGR) - ENGR 83B - DESIGN AND MANUFACTURING IN THE BIOMEDICAL ENGINEERING FIELD - Sterility - Students who successfully complete this course should be able to identify major requirements for sterility in clean rooms. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active	**Assessment Method:** Final exam questions on sterility. **Assessment Method Type:** Exam - Course Test/Quiz **Target for Success:** 75% of the students taking the exam answering half of the questions on sterility correctly AND 50% of the students taking the exam answering all of the questions on sterility correctly.	04/25/2015 - 100% of the students taking the exam answered half of the questions on sterility correctly AND 65% of the students taking the exam answered all of the questions on sterility correctly. **Result:** Target Met **Year This Assessment Occurred:** 2014-2015	
Department - Engineering (ENGR) - ENGR 83C - INTRODUCTION TO MEDICAL DEVICE REGULATIONS - Device classification - Students who successfully complete this course should be able to classify a medical device based on the level of control needed to assure safety and effectiveness. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 83C - INTRODUCTION TO MEDICAL DEVICE REGULATIONS - Good Manufacturing Processes - Students who successfully complete this course should be able to identify major requirements of Good Manufacturing Processes. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:**			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Active Department - Engineering (ENGR) - ENGR 83D - INTRODUCTION TO QUALITY ASSURANCE - Corrective and preventative actions - Students who successfully complete this course should be able to analyze and propose corrective and preventative actions. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 83D - INTRODUCTION TO QUALITY ASSURANCE - FDA regulations - Students who successfully complete this course should be able to summarize FDA regulations in relation to quality assurance requirements. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			
Department - Engineering (ENGR) - ENGR 83E - INTRODUCTION TO DOCUMENTATION - Definition of a medical device - Students who successfully complete this course should be able to identify a medical device based on its functions. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Department - Engineering (ENGR) - ENGR 83E - INTRODUCTION TO DOCUMENTATION - Medical device documents - Students who successfully complete this course should be able to identify major elements of medical device documents. (Created By Department - Engineering (ENGR)) **Assessment Cycles:** End of Quarter **Course-Level SLO Status:** Active			

Unit Assessment Report - Four Column

Foothill College

Program (PSME - ENGR) - Engineering AS

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
Program (PSME - ENGR) - Engineering AS - 1 - Formulate logical problem solving approaches, generate solutions, and assess the reasonableness of the solutions for engineering type analysis problems. **SLO Status:** Active	**Assessment Method:** In class Brainstorming and House of Quality activities assessed during Engr 10. Engr 10 is offered every quarter, and will be assessed annually. For 2011-2012, it will be assessed in Winter 2012. **Assessment Method Type:** Class/Lab Project **Target:** 70% of the Engineering 10 class will complete the assignment with a B or better.	03/08/2012 - I found that 70.8% of the students completing Engineering 10 completed the assignment with a B or better. **Result:** Target Met **Year This Assessment Occurred:** 2011-2012	03/08/2012 - While the target was met, this might not be the best assessment for the program as this assignment is given at the beginning of the first course in the program sequence.
Program (PSME - ENGR) - Engineering AS - 2 - Design, construct, and produce creative solutions to engineering problems by applying the engineering design process and identifying pertinent design parameters based on the fundamental physics governing a system. **SLO Status:** Active	**Assessment Method:** Large engineering design project in Engineering 10. Engr 10 is offered every quarter, and will be assessed annually. For 2011-2012, it will be assessed in Winter 2012. **Assessment Method Type:** Class/Lab Project **Target:** 80% of the class will get a B or better on the grades associated with the final report, presentation, and demo.	11/20/2012 - 83.3% of the class earned a B for better on the final report, presentation, and demo. **Result:** Target Met **Year This Assessment Occurred:** 2011-2012	11/20/2012 - The students are doing great. There is always room for them to be doing better, however.
Program (PSME - ENGR) - Engineering AS - 3 - Demonstrated understanding of the fundamental knowledge necessary for the practice of, or for advanced study in, engineering, including scientific principles, rigorous analysis, and problem solving. **SLO Status:** Active	**Assessment Method:** In class exam score. 20111-2012 Winter for Static class, E35 **Assessment Method Type:** Exam - Course Test/Quiz **Target:** 75% of the students earning a C or higher.	11/22/2012 - The average score of quarter's final exam shows a 79.9% for the winter class. Detailed analysis by breaking down in different subjects shows that student had good grasp on basic application and problem solving skills: 85% in 3D rigid body equilibrium, 83% in Truss analysis, 75% in Beams analysis. Three low score subjects are: friction, 42%, moment of inertia, 63%, and finally, equivalent force system, 52%. Friction is introduced in the very last portion of the	11/22/2012 - 1) more in-class excise focusing on Equivalent force system so students have more guidance on this part of problem solving. 2) more in-class excise on moment of inertia so students have more practice on combining their math with engineering application.

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
		quarter. Apparently students didn't have enough time to fully digest the subject. They have basic understanding, but not enough skill to analyze advance situation. Moment of inertia has a similar factor as friction, which was introduced just before the final, and their math skill is still limited to just solve equations, but application of calculus not solid. Equivalent force system is rather abstract, which has been the most difficult subject. **Result:** Target Met **Year This Assessment Occurred:** 2011-2012	
Program (PSME - ENGR) - Engineering AS - 4 - Demonstrated clear communication skills, responsible teamwork, professional attitudes and ethics. **SLO Status:** Active	**Assessment Method:** Final presentations assessed during Engr 10. Engr 10 is offered every quarter, and will be assessed annually. For 2011-2012, it will be assessed in Winter 2012. **Assessment Method Type:** Presentation/Performance **Target:** 70% of students giving the final presentations earn a B or higher on the presentation portion of the final project.	11/20/2012 - 100% of the students earning a grade in the course earned a B or higher on the presentation portion of the final project. **Result:** Target Met **Year This Assessment Occurred:** 2011-2012	11/20/2012 - Because of the overwhelming success of the students on their final presentations, we will consider increasing the target from earning a B or better to earning an A or better.
	Assessment Method: Survey of peer evaluation on teamwork assessed during Engr 10. Engr 10 is offered every quarter, and will be assessed annually. For 2011-2012, it will be assessed in Winter 2012. **Assessment Method Type:** Survey **Target:** 70% of students rated as "Satisfactory" or above.	03/21/2012 - 87.5% of the students in Engr 10 were rated as "Satisfactory" or above by their peers. **Result:** Target Met **Year This Assessment Occurred:** 2011-2012	03/21/2012 - The students did very well this quarter, much better than I anticipated. They have definitely learned how to work well as a team. I hope they take this skill with them as they progress through their degree plans and beyond.
Program (PSME - ENGR) - Engineering AS - 5 - Demonstrated a preparation for the			

PL-SLOs	Means of Assessment & Target / Tasks	Assessment Findings/Reflections	Action Plan & Follow-Up
complex work environment and continuous learning. **SLO Status:** Inactive			