

The Program Review process should serve as a mechanism for the assessment of performance that recognizes and acknowledges good performance and academic excellence, improves the quality of instruction and services, updates programs and services, and fosters self-renewal and self-study. Further, it should provide for the identification of weak performance and assist programs in achieving needed improvement. Finally, program review should be seen as a component of campus planning that will not only lead to better utilization of existing resources, but also lead to increased quality of instruction and service. A major function of program review should be to monitor and pursue the congruence between the goals and priorities of the college and the actual practices in the program or service.

~Academic Senate for California Community Colleges

DEPARTMENT OR PROGRAM: Physics

DIVISION: Math/Science

1. BRIEF DESCRIPTION OF PROGRAM:

The Physics department at CSM offers 4 sequences for students. Which sequence students take depends on their major and the institution they plan to transfer to.

Physics 100 is a one-sequence course which satisfies the GE requirement of a Physical Science for transfer or AA/AS degree.

The Physics 210-220 sequence is designed for students majoring in some field of letters and science. It is required for students planning to enter Medicine, Dentistry, Pharmacy, Optometry, Agriculture, or Forestry.

The Physics 210-211-220-221 sequence is required by some transfer institutions (mainly UC's) for students majoring in fields listed above.

Physics 250-260-270 constitute a three-semester program designed to give students majoring in Engineering, Physics or Chemistry a thorough foundation in the fundamentals of physics.

The department also offers a preparation course, Physics 150, which is designed to get underprepared students ready for the Physics 210-220 and 250-260-270 sequences.

In addition, a three-course sequence, Phys 126-127-128 (cross-listed as BIOL 126-127-128) was added for students interested in careers in science education. These one-unit courses were developed as part of the Aurora project, which in turn is part of the CalTeach project. Each class is limited to a maximum of six students, due to funding for the stipends that students receive. Currently, one physics faculty member and one biology faculty member each get one unit of load for all three courses. These courses are, but probably

should not be given the special nature and history of the courses, included in the LOAD calculations for the physics department. They typically carry LOADs well below 100.

Beginning in Fall 2012, the department will offer an Honors Seminar in coordination with the other programs in the Math/Science Division.

2. Based on the elements in your *Core Program and Student Success Indicators* (provided by PRIE for each program) and the goals stated in your most recent Program Review, please identify any key successes and challenges.

LOAD in Physics has trended into the mid to upper 400s (446-487 in 3 of the last 4 semesters of data provided). Spring 2011 showed a LOAD below 400 and cutting the low enrolled Physics 150 section this spring should bring load up for this semester.

There are several reasons that LOAD in Physics is likely to remain in the upper 400s or lower 500s. For some of our courses LOAD cannot reach 525. In the Spring, LOAD for Physics 150 and 220 is at most 467 (by enrollment limit). For Physics 221 in the spring, LOAD is at most 360. This one-unit course is necessary for our UC bound students majoring in Biological Sciences. Physics 126/127/128 typically have a combined enrollment of 2 or 3 students. This results in LOADs considerably below 100. Commitment to student success in Physics has meant approximately 4.2 FLC in the Integrated Science Center being assigned to Physics. This assignment aids in collecting WSCH in other courses, but itself generates no WSCH. These fore mentioned effects are balanced somewhat by Physics 100 which can have a LOAD exceeding 1000.

3. Are you on track for meeting the goals/targets that your program identified in its most recent Program Review? If not, please explain possible reasons why. If needed, update your goal/targets based on these reasons.

The goals mentioned in the last program review were to increase enrollments and success/retention while maintaining the integrity of the department.

Specific courses with low enrollments in the 2010-2011 year were Physics 260 in both semesters. Physics 270 in Spring 2011 and Physics 220 in Spring 2011. One of the action steps we have taken is to increase the number of sections offered which feed into these second and third courses in a sequence. From Summer 2010 to Summer 2011, we have added two additional summer Physics 250 section and the result has been enrollments in Physics 260 in the Fall 2011 and Physics 270 in the Spring 2012 have been above capacity. We also added a third section of Physics 210 to our fall schedule which filled to capacity. The result was increased enrollment in Physics 220 this spring. This leaves only the Spring Physics 260 section as low enrolled two years in a row, which may indicate a trend. The department hopes to increase enrollments in Physics 260 for Spring 2013 by offering a third section of Physics 250, possibly in the evening, to the Fall 2012 schedule, if the budget allows.

Some of the faculty in the department are still interested in determining the effectiveness of teaching Physics as hybrid courses with online lectures. Determining the effectiveness of the online delivery of the lectures would require having two groups of students in one semester - one group receiving the lecture traditionally and one group receiving the lecture through online delivery. The two groups would meet together for the lab portion of the course. Through consultation with the dean in Spring 2011, it was determined that development of

materials for delivering online lectures for Physics 220 should occur with support of a Measure G grant. In Fall 2011, the dean asked that we drop development of online materials for Physics 220. This is in part because we added a third Physics 210 section which has led to increased Physics 220 enrollment; however, this has left most of the Measure G grant awarded to Prof. Grigorescu and Prof. Locke in limbo.

The administration has been slow to act on the Title V violations mentioned in the 2010 Program Review quoted here:

Course content presented in Skyline's Physics 250 is not aligned with the Physics 250 Course Outline. Students who take Physics 250 at Skyline are not prepared for Physics 260, because they have not seen simple harmonic motion or mechanical waves. Students who take Physics 250 at Skyline are not prepared for Physics 270, because they have not seen simple harmonic motion, fluids or mechanical waves. The department hopes that the district will take up this Title V violation and make sure that course content for courses with the same course number aligns across the district.

4. Have you identified any new goals or projects for the program to focus on during this next year? Please explain (grants, stipends, initiatives, etc.).

Lab Manuals are continually updated. With the work of Professors Locke and Uchida during the Spring 2008 and 2009 semesters, major revisions to lab manuals and the texts for Physics 211, 221, and 150 have been completed. Minor revisions will continue to be completed.

5. Are there any critical issues you expect to face in the coming year? How will you address those challenges?

Students in Physics 250 are severely lacking in Calculus preparation. This needs to be investigated with the math departments at the 3 colleges in the district. A solution may require adding a short course to run the first week or two of each semester to get students up to where they should be at the end of Math 251.

Students in both Physics 210 and 250 are lacking in problem solving skills they should enter the class with. The department is hoping that the revisions that have been done for the Physics 150 course will better develop students' problem solving skills. The department also needs to make sure that students who need to take Physics 150 do.

6. STUDENT LEARNING OUTCOMES (SLOs) AND ASSESSMENT FOCUS FOR THIS YEAR:

- a. Academic areas: Identify at least one course SLO on which to focus. Describe the assessment strategies you will use and your method of reflection and documentation for this cycle.

The Physics department has had ongoing assessment of all course SLOs. Results are/will be documented in tracdat. The department has discussed results which did not meet the set success criterion and discussed strategies to improve student learning in those areas.

- b. Student services areas: TBD

7. **SUMMARY OF RESOURCES NEEDED TO REACH PROGRAM ACTION STEPS**

(Data resources: Educational Master Plan, 2008, Institutional Priorities, 2008-2011, College Index, 2009-2010, GE-SLOs, SLOs; department records; Core Program and Student Success Indicators; previous Program Review and Planning reports)

- a. In the matrices below, itemize the resources needed to reach program action steps and describe the expected outcomes for program improvement.* Specifically, describe the potential outcomes of receiving these resources and the programmatic impact if the requested resources cannot be granted.

*Note: Whenever possible, requests should stem from assessment of SLOs and the resulting program changes or plans. Ideally, SLOs are assessed, the assessments lead to planning, and the resources requested link directly to those plans.

Full-Time Faculty Positions Requested	Expected Outcomes if Granted and Expected Impact if Not Granted	If applicable, <u>briefly</u> indicate how the requested resources will link to achieving department action steps based on SLO assessment.
Two full-time faculty members will likely retire within the next 5 years. We will likely need to hire one full-time faculty member in two or three years and another in four or five years.	Full-time faculty are essential for student access to faculty outside of class hours. Part-time faculty have limited availability due to commitments to additional employment in industry or in other community college districts. It is essential for student success for there to be access to instructors over more hours of the week.	

Classified Positions Requested	Expected Outcomes if Granted and Expected Impact if Not Granted	If applicable, <u>briefly</u> indicate how the requested resources will link to achieving department action steps based on SLO assessment.
None requested at this time.		

- b. For instructional resources including equipment and materials, please list the exact items you want to acquire and the total costs, including tax, shipping, and handling. Include items used for instruction (such as computers, furniture for labs and centers) and all materials designed for use by students and instructors as a learning resource (such as lab equipment, books, CDs, technology-based materials, educational software, tests, non-

printed materials). Add rows to the tables as necessary. If you have questions as to the specificity required, please consult with your division dean. Please list by priority.

Resources Requested	Expected Outcomes if Granted and Expected Impact if Not Granted	If applicable, <u>briefly</u> indicate how the requested resources will link to achieving department action steps based on SLO assessment.
<p>Item: Supplies budget – <i>Itemized in Grid Below*</i> Number: See Grid Below* Vendor: See Grid Below* Unit price: See Grid Below* Total Cost: \$2000.00 Status*: Replacement, repair and maintenance of existing lab and demo equipment;</p>	<p>If we have money to maintain our current laboratory and demonstration equipment we will be able to continue to meet course requirements and SLOs.</p>	
<p>Item: Tablet PC Number: 2 Vendor: HP through ITS Unit price: \$1477.44 Total Cost: \$3,206.05 Status*: New</p>	<p>A single tablet PC shared by the department faculty would allow for development of online lecture material, as well as other online contact for bricks and mortar courses. A tablet PC would allow for presentation of problem solving through synchronous and asynchronous distance education.</p> <p>Ideally, the department would have two tablet PC's available for checkout from the stockroom. These would be shared between the current 3 full-time and 2 part-time faculty.</p> <p>The expected outcome is greater student success. Even in bricks and mortar courses, a tablet PC would allow for recording and playback of problems demonstrating problem solving strategies.</p>	
<p>Item: Lottery Requests - <i>Itemized in Grid Below*</i> Number: See Grid Below* Vendor: See Grid Below* Unit price: See Grid Below* Total Cost: \$2000.00 Status*: Replacement of existing lab and demo equipment;</p>	<p>If we have money to maintain our current laboratory and demonstration equipment we will be able to continue to meet course requirements and SLOs.</p>	

Item	Vendor	Cost Per Unit	Number of Units	Cost with Tax
Vernier caliper with black markings	Global Industrial	\$55.00	10	\$596.75
Laptop Batteries	Amazon	\$120.00	2	\$260.40
Flashlights - winding w/metal gears	Amazon	\$22.00	10	\$238.70
Micrometers Mitutoyo	Amazon	\$55.00	4	\$238.70
Goggles	Edmund Scientific	\$11.50	10	\$124.78
Banana to spade adaptor		\$5.00	30	\$162.75
Spectrum Tube - Hydrogen and Helium	Edmund Scientific	\$32.95	3	\$107.25
Water heater	Amazon	\$35.00	2	\$75.95
9V Batteries - 10pcs C cell batteries - 24 pcs AAA batteries - 24pcs	BudgetBatteries.com (repeat last year's order)			\$65.87
Mathematica Premier Service	Wolfram Research	\$49.00	1	\$53.17
Lens 10 cm Pasco	Pasco Scientific	\$45.00	1	\$48.83
Stopwatch batteries		\$20.00	1	\$21.70
Straight Filament Bulb	The Home Depot	4.34	1	\$4.71
				\$1,999.55

8. PROGRAM REVIEW PARTICIPANTS AND SIGNATURES

Date of this *Annual Update for Program Review and Planning* evaluation:

Please list the department's *Annual Update for Program Review and Planning* report team as appropriate:

Primary program contact person: David Locke
Phone and email address: 650-574-6624 locke@smccd.edu
Full-time faculty: David Locke, Barbara Uchida
Part-time faculty:
Administrators:
Classified staff: Violeta Grigorescu
Students:

<hr/> <i>Primary Program Contact Person's Signature</i>	<i>Date</i>
<hr/> <i>Full-time Faculty's Signature</i>	<i>Date</i>
<hr/> <i>Part-time Faculty's Signature</i> (as appropriate)	<i>Date</i>
<hr/> <i>Administrator's Signature</i> (as appropriate)	<i>Date</i>
<hr/> <i>Classified Staff Person's Signature</i> (as appropriate)	<i>Date</i>
<hr/> <i>Student's Signature</i> (as appropriate)	<i>Date</i>
<hr/> <i>Dean's Signature</i>	<i>Date</i>