COLLEGE of SAN MATEO

Annual Update

Approved 9/2/08 Governing Council

This Annual update is due on March 25th of each year that your three year Program review and planning document is not due. Please email a copy of this to you Division dean, the VP of Instruction and the Academic Senate President.

1. What is the name of your Department and/or Division?

Department: Physics
Division: Math/Science

2. List the names of everyone who participated in developing this annual update.

David Locke
Barbara Uchida
Mohsen Janatpour
Yuriy Sushko

3. Based on the elements in your Annual Update Data Sheet (Provided by IRP to your dean) and goals stated in your most recent Program Review, please identify any key successes and challenges.

From Physics Program Review Fall 2007

Physics department goals for the next year include:

- continue to write and revise laboratory experiments to utilize updated lab equipment
- receive training in use of PASCO Data Studio software and ScienceWorkshop interface for use in updating physics labs
- two faculty members will be applying for release time for the spring semester to try to accomplish the above goals
- purchase new equipment and more fully develop experiments for the new Physics 101 lab
- continue updating course outlines for all physics courses offered at CSM
- begin assessment of student learning outcomes for the department

Physics department goals for the long term include:

- increase enrollments in physics while maintaining the integrity of the program
- evaluate the success of students in Physics 210 and 250 who have completed the preparation course, Physics 150, to determine the effectiveness of the course
- make revisions to Physics 150 to increase its effectiveness
- evaluate and revise the Physics Readiness Exam

(It will require release time to do a thorough job with these goals.)

Successes:
The department accomplished all of the "goals for the next year" as stated in the 2007 Department Program Review.

Among the long term goals, enrollments have grown for the department (although overall LOAD has decreased – see challenges below), while integrity has been maintained.
Professors Locke and Uchida have received release time for the current semester to make revisions for Physics 150 (as well as Physics 211 and 221), including producing a new version of the text and an instructors manual for the course.

Challenges:
In the 2007-2008 academic year, the department had a growth in enrollment and a growth in the number of sections offered. As expected when first increasing the number of sections offered, LOAD decreased. With cuts to the number of sections offered in the current academic year (FTE reduced to 5.87 from 7.17) and the projected WSCH (2491) LOAD can be projected to go up about 30%.
Tracking the effect of Physics 150 on student success in Physics 210 and Physics 250 has not yet been completed. It is difficult for the department to track students from one course to the next, when the courses are not taught by the same instructor. However, we are more confident about gathering data after meeting with John Sewart in PRIE. Apparently, the college can track students in Banner for this exact purpose.

4. 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 reason.

Yes

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

Remove mid-semester flex days from the academic calendar. See 6 below for the negative impacts of the flex days on students.

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

A 15-week calendar threatens student success.

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.

The flex-days added into the Fall 2009 and Spring 2010 remove important class instruction days and cause lab courses to meet for more than 3 hours. This could have a negative impact on SLO's and enrollment for all of the sciences. Many students cannot take a day lab that goes until 5:25 pm, due to work, day-care, or other factors. The department hopes to meet with AFT soon to avoid facing the same problems in the Fall 2010 and Spring 2011 schedules, but has not been successful in having our concerns heard. The placement of the Fall flex days is particularly poor for student performance. To in the last quarter of the semester give students a 5-day and a 4-day weekend is a poor pedagogical choice. If one or two flex days are to be placed between the first day of instruction and the first day of finals, it would work much better for student success to place it between the last day of instruction and the first day of finals.

7. Student Learning Outcome and Assessment focus for this year:
    a. Academic areas: Identify at least one course SLO in on which to focus. Describe the assessment strategies you will use and your method of reflection and documentation for this cycle.

Course SLO assessment has begun. See attached course SLO matrices for Fall 2008 assessment results.

    b. Student services areas: TBD

Not needed for instructional departments per John Sewart – 11 March 2009.

8. **SUMMARY OF RESOURCES NEEDED TO REACH PROGRAM ACTION STEPS** *(Data resources: Educational Master Plan, 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, briefly 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, briefly indicate how the requested resources will link to achieving department action steps based on SLO assessment.**
None		

    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, briefly indicate how the requested resources will link to achieving department action steps based on SLO assessment.
Item: Diffraction and Interference with Visible Light **Number:** See Below **Vendor:** PASCO **Unit price:** $615 **Total Cost: $5571.90** **Status*:** New/Replacement*	This experiment would help students visualize interference and diffraction of visible light and allow them to test the formulas for intensity in interference and diffraction patterns. This is a replacement in the sense that we currently look at intensity in interference and diffraction patterns using microwaves. However, using the current microwave equipment gives less reliable quantitative data.	
Item: Gyroscope **Number: ME-8960** **Vendor:** PASCO **Unit price:** $735 **Total Cost: $832.39** **Status*:** New/Replacement*	A gyroscope is necessary to demonstrate the three degrees of freedom in rotational motion. Although the department has a gyroscope, it is probably 40 years old (or more). Due to wear, it has increased friction and is too loud to talk over when discussing the gyroscope.	

** Status = New, Upgrade, Replacement, Maintenance or Repair.*

Diffraction and Interference with Visible Light

Part Number	Name	Unit Price
OS-8453	High Precision Diffraction Slits	$159.00
OS-8525A	Diode Laser	$199.00
CI-6504A	Light Sensor	$59.00
OS-8435	Linear Translator	$109.00
OS-8434A	Aperture Bracket	$89.00
	One Experiment Price	**$615.00**
	Classroom Set of 8 Experiments	**$4,920.00**
	Tax and Shipping	$651.90
	Total Cost	**$5,571.90**

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Primary faculty contact *Date*

_____

Additional faculty *Date*

_____

Additional faculty *Date*

2008-2009 CSM Course SLO Form

Course Name: Physics 100

Course Mission/Purpose: To introduce students to the concepts of physics, the most basic of all the sciences.

Step 1. Student Learning Outcome(s) Defined (what students will learn, know, do or value at course end)	**Step 2. Assessment Tool/ Measurement Instrument** (identify methodology or tool for collection of evidence of learning e.g., pre/post tests, surveys, papers, anecdotal evidence, etc.)	**Step 3. Assessment of SLO(s)** (what were the assessment tool results e.g., raw data, scores, etc.?)	**Step 4. Timelines/ Term Assessed** (list dates when assessment tool will be administered and assessment data will be collected and analyzed)	**Step 5. Analyze/Evaluate Assessment Results** (identify who will review and analyze data from tests, surveys, etc. What do the measurement results reveal in relation to the learning outcome?)	**Step 6. Recommendation/ Action** (using assessment results and analysis, what changes, if any, will be made to instruction methodologies or SLO assessment design? Or if SLO results positive, will a new SLO be identified?)
SLO #1: State Newton's Law's of Motion, explain the meaning of each, and identify applications of each.	A question on the final exam asking for the student to state a specified Law and explain its meaning. For each of Newton's 3 Law's of Motion, a question on the final which requires its application. Check percentage of students correct on these 4.	Application of Newton's Laws 1st 95% 2nd 45% 3rd 83%	Dec 2008 and May 2009 (unless the final is scheduled for June)		June 2009
SLO #2: List and identify forms of energy and ways in which one form of energy can be transformed into another form (e.g. mechanical energy being transformed to electrical energy by a water wheel). This may include kinetic energy, potential energy, thermal energy, temperature, work, heat, atomic energy, nuclear energy, and photons.	A question on the final requiring the use of conservation of energy. Check the percentage of students who: ▪ Identify the problem as requiring conservation of energy. ▪ Identify the forms of energy present. ▪ Correctly answer the question.		Dec 2008 and May 2009 (unless the final is scheduled for June)		June 2009

SLO #3: State the source of electric and magnetic forces and fields. Describe phenomena relating to electricty and magnetism.	Percentage of students correctly answering questions on the final as to the source of electric and magnetic forces and fields.		Dec 2008 and May 2009 (unless the final is scheduled for June)		June 2009
SLO #4: Describe matter on the atomic scale, the properties and nature of the different states of matter, and the properties of different types of waves which may include light and sound.	Questions on final. Percentage of students correctly answering a question on Atomic Structure and a question on the Fluid State of Matter.		Dec 2008 and May 2009 (unless the final is scheduled for June)		June 2009

2008-2009 CSM Course SLO Form

Course Name: Physics 150

Course Mission/Purpose: To prepare students to succeed in Physics 210 or Physics 250.

Step 1. Student Learning Outcome(s) Defined (what students will learn, know, do or value at course end)	**Step 2. Assessment Tool/ Measurement Instrument** (identify methodology or tool for collection of evidence of learning e.g., pre/post tests, surveys, papers, anecdotal evidence, etc.)	**Step 3. Assessment of SLO(s)** (what were the assessment tool results e.g., raw data, scores, etc.?)	**Step 4. Timelines/ Term Assessed** (list dates when assessment tool will be administered and assessment data will be collected and analyzed)	**Step 5. Analyze/Evaluate Assessment Results** (identify who will review and analyze data from tests, surveys, etc. What do the measurement results reveal in relation to the learning outcome?)	**Step 6. Recommendation/ Action** (using assessment results and analysis, what changes, if any, will be made to instruction methodologies or SLO assessment design? Or if SLO results positive, will a new SLO be identified?)
SLO #1: Solve symbolic algebra equations and systems of equations for specified variables.	Percentage of students scoring 75% or higher on the symbolic algebra portion of the final exam.	100%	Dec 2008 and May 2009 (unless the final is scheduled for June)		June 2009
SLO #2: Create and analyze scientific graphs with appropriate accuracy.	Percentage of students passing the scientific graphing section on the Mastery Test.	100%	Dec 2008 and May 2009 (unless the final is scheduled for June)		June 2009
SLO #2: Solve problems which require vector addition.	Percentage of students scoring 75% or higher on a vector addition problem on the final exam.	60%	Dec 2008 and May 2009 (unless the final is scheduled for June)	Physics 150 should have some restructuring done to allow instructors to spend a larger portion of the course eon Vector Addition. Profs. Locke and Uchida are working on revisions to the Physics 150 course this semester.	June 2009

SLO #2: Analyze graphs of position, velocity and acceleration and answer qualitative and quantitative questions using the graphs.	Percentage of students scoring 75% or higher on the Kinematic Graphs portion of the final exam.	Was not tested on the final exam, but 100% of the students who successfully completed the course received above 80% on the graph portion of the Kinematics Mastery Test.	Dec 2008 and May 2009 (unless the final is scheduled for June)		June 2009
SLO #2: Set-up and solve kinematics problems.	Percentage of students scoring 75% or higher on the Kinematics Problems portion of the final exam.	100%	Dec 2008 and May 2009 (unless the final is scheduled for June)		June 2009
SLO #2: Collect and analyze data to verify physical principles.	Percentage of students completing the laboratory exercises for the class.	100%	Dec 2008 and May 2009 (unless the final is scheduled for June)		June 2009

2008-2009 CSM Course SLO Form

Course Name: _Physics 210AX and BX __**(SLO's assessed for Fall 2008;** Based on 24 students who received C or higher in the course**)**___

Course Mission/Purpose: _____

Step 1. **Student Learning Outcome(s) Defined** **(what students will learn, know, do or value at course end)**	**Step 2.** **Assessment Tool/ Measurement Instrument** **(identify methodology or tool for collection of evidence of learning e.g., pre/post tests, surveys, papers, anecdotal evidence, etc.)**	**Step 3.** **Assessment of SLO(s)** **(what were the assessment tool results e.g., raw data, scores, etc.?)**	**Step 4.** **Timelines/ Term Assessed** **(list dates when assessment tool will be administered and assessment data will be collected and analyzed)**	**Step 5.** **Analyze/Evaluate Assessment Results** **(identify who will review and analyze data from tests, surveys, etc. What do the measurement results reveal in relation to the learning outcome?)**	**Step 6.** **Recommendation/ Action** **(using assessment results and analysis, what changes, if any, will be made to instruction methodologies or SLO assessment design? Or if SLO results positive, will a new SLO be identified?)**
SLO #1: Identify problems that should be solved using Newton's Laws of Motion and correctly solve them.	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify--- 100% Achieve a score of C or higher on the problem---100%			
SLO #2: Identify problems that should be solved using the Work-Energy Theorem and correctly solve them.	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify--- 100% Achieve a score of C or higher on the problem---92%			
SLO #3: Identify problems that should be solved using Conservation of Momentum (Linear and Angular) and correctly solve them.	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify--- 100% Achieve a score of C or higher on the problem---87.5%			

SLO #4: Identify and correctly solve problems involving ideal gases. This may include defining an ideal gas, using the ideal gas law (equation of state), problems involving work and energy, distribution of speeds, definition of	Check final exam problems for percent of students who achieved C or higher on these problems.	I dentify--- 100% Achieve a score of C or higher on the problem---100%			
SLO#5. Identify problems that should be solved using the First and/or Second Law of Thermodynamics and correctly solve them.	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify--- 100% Achieve a score of C or higher on the problem---92%			
SLO #6 .Collect and analyze data to verify physics principles.	Any student passing the lab portion of the course (70% or higher) should have demonstrated this.	Identify--- 100% Achieve a score of C or higher on the problem---100%			

2008-2009 CSM Course SLO Form

Course Name: _Physics 211

Course Name: _Phys 211__(SLO's assessed for Fall 2008; Based on 14 students who received C or higher in the course

Course Mission/Purpose: _____

Step 1. Student Learning Outcome(s) Defined (what students will learn, know, do or value at course end)	**Step 2. Assessment Tool/ Measurement Instrument** (identify methodology or tool for collection of evidence of learning e.g., pre/post tests, surveys, papers, anecdotal evidence, etc.)	**Step 3. Assessment of SLO(s)** (what were the assessment tool results e.g., raw data, scores, etc.?)	**Step 4. Timelines/ Term Assessed** (list dates when assessment tool will be administered and assessment data will be collected and analyzed)	**Step 5. Analyze/Evaluate Assessment Results** (identify who will review and analyze data from tests, surveys, etc. What do the measurement results reveal in relation to the learning outcome?)	**Step 6. Recommendation/ Action** (using assessment results and analysis, what changes, if any, will be made to instruction methodologies or SLO assessment design? Or if SLO results positive, will a new SLO be identified?)
SLO #1: Identify mechanics and thermodynamics problems that should be solved using differential calculus and correctly solve them. .	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify--- 100% Achieve a score of C or higher on the problem---100%			
SLO #2: Identify mechanics and thermodynamics problems that should be solved using integral calculus and correctly solve them.	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify--- 100% Achieve a score of C or higher on the problem---97%			

2008-2009 CSM Course SLO Form

Course Name: _Physics 220 __(SLO's assessed for Fall 2008**;** Based on 5 students who received C or higher in the course**)____**

Course Mission/Purpose: _____

Step 1. Student Learning Outcome(s) Defined (what students will learn, know, do or value at course end)	**Step 2. Assessment Tool/ Measurement Instrument** (identify methodology or tool for collection of evidence of learning e.g., pre/post tests, surveys, papers, anecdotal evidence, etc.)	**Step 3. Assessment of SLO(s)** (what were the assessment tool results e.g., raw data, scores, etc.?)	**Step 4. Timelines/ Term Assessed** (list dates when assessment tool will be administered and assessment data will be collected and analyzed)	**Step 5. Analyze/Evaluate Assessment Results** (identify who will review and analyze data from tests, surveys, etc. What do the measurement results reveal in relation to the learning outcome?)	**Step 6. Recommendation/ Action** (using assessment results and analysis, what changes, if any, will be made to instruction methodologies or SLO assessment design? Or if SLO results positive, will a new SLO be identified?)
SLO #1: Identify problems involving electric and/or magnetic fields and forces and correctly solve them.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem.	Electric fields: • 100% • 100% Magnetic fields • 100% • 80%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO #2: Analyze DC circuits. .	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem	 • 100% • 100%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO #3: Identify problems that should be solved using concepts of geometric and physical optics and correctly solve them. This includes but is not limited to image formation and interference problems.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem .	Image formation • 100% • 100% Interference • 100% • 100%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009

SLO #4: Identify problems involving quantization of energy and correctly solve them. This includes but is not limited to the photoelectric effect and energy levels in atoms.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem .	Photoelectric effect • 100% • 80% Energy levels • 100% • 100%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO#5. Identify problems involving the structure of the atom and the nucleus and correctly solve them. This includes but is not limited to the quantum-mechanical view of atoms and nuclear binding energy and radioactivity.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem .	• 100% • 100%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO #6 Collect and analyze data to verify physics principles.	Any student passing the lab portion of the course (70% or higher) should have demonstrated this.	• 100%	December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009

2008-2009 CSM Course SLO Form

Course Name: _Physics 221

Course Mission/Purpose: _____

Step 1. **Student Learning Outcome(s) Defined** **(what students will learn, know, do or value at course end)**	**Step 2.** **Assessment Tool/ Measurement Instrument** **(identify methodology or tool for collection of evidence of learning e.g., pre/post tests, surveys, papers, anecdotal evidence, etc.)**	**Step 3.** **Assessment of SLO(s)** **(what were the assessment tool results e.g., raw data, scores, etc.?)**	**Step 4.** **Timelines/ Term Assessed** **(list dates when assessment tool will be administered and assessment data will be collected and analyzed)**	**Step 5.** **Analyze/Evaluate Assessment Results** **(identify who will review and analyze data from tests, surveys, etc. What do the measurement results reveal in relation to the learning outcome?)**	**Step 6.** **Recommendation/ Action** **(using assessment results and analysis, what changes, if any, will be made to instruction methodologies or SLO assessment design? Or if SLO results positive, will a new SLO be identified?)**
SLO #1: Identify electricity and magnetism, optics, and modern physics problems that should be solved using differential calculus and correctly solve them. .	Questions on exams	Identify 100% Correctly Solve 100%	Throughout Fall 2008 and Spring 2009.	January 2000 June 2009	June 2009
SLO #2: . Identify electricity and magnetism, optics, and modern physics problems that should be solved using integral calculus and correctly solve them. .	Questions on exams.	Identify 100% Correctly Solve 100%	Throughout Fall 2008 and Spring 2009.	January 2000 June 2009	June 2009

2008-2009 CSM Course SLO Form

Course Name: _Phys 250__(SLO's assessed for Fall 2008; Based on 13 students who received C or higher in the course**)_____**

Course Mission/Purpose: _____

Step 1. Student Learning Outcome(s) Defined (what students will learn, know, do or value at course end)	**Step 2. Assessment Tool/ Measurement Instrument** (identify methodology or tool for collection of evidence of learning e.g., pre/post tests, surveys, papers, anecdotal evidence, etc.)	**Step 3. Assessment of SLO(s)** (what were the assessment tool results e.g., raw data, scores, etc.?)	**Step 4. Timelines/ Term Assessed** (list dates when assessment tool will be administered and assessment data will be collected and analyzed)	**Step 5. Analyze/Evaluate Assessment Results** (identify who will review and analyze data from tests, surveys, etc. What do the measurement results reveal in relation to the learning outcome?)	**Step 6. Recommendation/ Action** (using assessment results and analysis, what changes, if any, will be made to instruction methodologies or SLO assessment design? Or if SLO results positive, will a new SLO be identified?)
SLO #1: Identify problems that should be solved using Newton's Laws of Motion and correctly solve them	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem	. • 100% • 85%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO #2: Identify problems that should be solved using the Work-Energy Theorem and correctly solve them.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem	. • 100% • 100%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO #3: Identify problems that should be solved using Conservation of Momentum (Linear and Angular) and correctly solve them.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem	Linear momentum • 100% • 60% Angular momentum • 85% • 77%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009

SLO #4: Collect and analyze data to verify physics principles.	Any student passing the lab portion of the course (70% or higher) should have demonstrated this.	100%	December 2008 May or June 2009	June 2009	June 2009

2008-2009 CSM Course SLO Form

Course Name: _Physics 260___(SLO's assessed for Fall 2008**;** Based on 13 students who received C or higher in the course**)**___

Course Mission/Purpose: _____

Step 1. **Student Learning Outcome(s) Defined** **(what students will learn, know, do or value at course end)**	**Step 2.** **Assessment Tool/ Measurement Instrument** **(identify methodology or tool for collection of evidence of learning e.g., pre/post tests, surveys, papers, anecdotal evidence, etc.)**	**Step 3.** **Assessment of SLO(s)** **(what were the assessment tool results e.g., raw data, scores, etc.?)**	**Step 4.** **Timelines/ Term Assessed** **(list dates when assessment tool will be administered and assessment data will be collected and analyzed)**	**Step 5.** **Analyze/Evaluate Assessment Results** **(identify who will review and analyze data from tests, surveys, etc. What do the measurement results reveal in relation to the learning outcome?)**	**Step 6.** **Recommendation/ Action** **(using assessment results and analysis, what changes, if any, will be made to instruction methodologies or SLO assessment design? Or if SLO results positive, will a new SLO be identified?)**
SLO #1: Identify problems that should be solved using Coulomb's Law for electric fields and electric forces and correctly solve them.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem	• 100% • 77%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO #2: Identify problems that should be solved using Gauss's Law for electric fields and correctly solve them.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem	• 100% • 69%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO #3: Identify problems that should be solved using Ampere's Law and correctly solve them.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem	• 100% • 62%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO #4:					

Identify problems that should be solved using Faraday's Law and correctly solve them.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem	• 85% • 31%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO #5: Analyze DC and AC circuits.	Problem on final exam:. Check percent of students who correctly • Identify • Achieve a score of C or higher on the problem	DC circuits • 100% • 77% AC circuits • 77% • 23%	Final Exams December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009
SLO #6: Collect and analyze data to verify physics principles.	Any student passing the lab portion of the course (70% or higher) should have demonstrated this.	• 100%	December 2008 May or June 2009	Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	June 2009

2008-2009 CSM Course SLO Form

Course Name: Phys 270__(SLO's assessed for Fall 2008; Based on 9 students who received C or higher in the course**)_____**

Course Mission/Purpose: _____

Step 1. **Student Learning Outcome(s) Defined** **(what students will learn, know, do or value at course end)**	**Step 2.** **Assessment Tool/ Measurement Instrument** **(identify methodology or tool for collection of evidence of learning e.g., pre/post tests, surveys, papers, anecdotal evidence, etc.)**	**Step 3.** **Assessment of SLO(s)** **(what were the assessment tool results e.g., raw data, scores, etc.?)**	**Step 4.** **Timelines/ Term Assessed** **(list dates when assessment tool will be administered and assessment data will be collected and analyzed)**	**Step 5.** **Analyze/Evaluate Assessment Results** **(identify who will review and analyze data from tests, surveys, etc. What do the measurement results reveal in relation to the learning outcome?)**	**Step 6.** **Recommendation/ Action** **(using assessment results and analysis, what changes, if any, will be made to instruction methodologies or SLO assessment design? Or if SLO results positive, will a new SLO be identified?)**
SLO #1: . Identify problems that should be solved using concepts of geometric optics and correctly solve them. This includes but is not limited to solving image formation problems.	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify: 100% Achieve a score of C or higher on the problem: 100%		Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	
SLO #2: . Identify problems that should be solved using physical optics and correctly solve them. This includes but is not limited to solving single and	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify: 100% Achieve a score of C or higher on the problem: 89%		Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	

double slit problems.					
SLO #3: This may include calorimetry, heat transfer, and thermal expansion. Identify and correctly solve problems involving heat and temperature..	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify: 100% Achieve a score of C or higher on the problem: 100%		Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	
SLO #4: . Identify and correctly solve problems involving ideal gases. This may include defining an ideal gas, using the ideal gas law (equation of state), problems involving work and energy, distribution of speeds, definition of temperature, and explanation of Cv for a diatomic gas.	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify: 100% Achieve a score of C or higher on the problem: 100%		Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	
SLO #5: Identify problems that should be solved using the First and/or Second Law	Check final exam problems for percent of students who achieved C or higher on these	Identify: 100% Achieve a score of C or higher on the problem: 100%		Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	

of Thermodynamics and correctly solve them. This may include heat engine cycles and their efficiency.	problems.				
SLO #6: Identify problems involving quantization of energy and correctly solve them. This includes but is not limited to the photoelectric effect and energy levels in atoms.	Check final exam problems for percent of students who achieved C or higher on these problems.	Identify: 89% Achieve a score of C or higher on the problem: 89%		Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	
SLO #7: Identify problems that should be solved using wave functions and correctly solve them. These may involve using Schrodinger's Equation to verify that a wave function is a solution and to find energy levels. These may also include problems involving probability.	Check final exam problems for percent of students who achieved C or higher on these problems.	Did not cover this SLO on my final exam Identify Achieve a score of C or higher on the problem		Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	

SLO #8: Collect and analyze data to verify physics principles.	Any student passing the lab portion of the course (70% or higher) should have demonstrated this.			Due to single section of course in Fall 2008, analysis and evaluation will take place after Spring 2009. June 2009	