Assessment: Course Four Column

SPRING / SUMMER 2016

El Camino: Course SLOs (NSC) - Physics

ECC: PHYS 12:Laboratory for Introductory Physics

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Data Collection & Analysis - Students can read and record, with appropriate units and uncertainties, measurements taken from a ruler a vernier and a protractor. Students can interpret and analyze that data, including error analysis. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 07/01/2013	**Laboratory Project/Report -** As a laboratory assignment, students will be asked to take measurements from a meter stick, a ruler, a scale and a protractor and to use some of those measurements to compute areas and volumes. Students will record the measurements and computed areas and volumes with appropriate units and uncertainties. **Standard and Target for Success:** It is expected that 60% of students will a grade of 6.0 or higher on this SLO.	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Every student earned a grade of 9 or higher for this SLO. This exceeds our benchmark of 70% of students earning a grade of 6.0 or higher on this SLO. For more information see related document (SLO#3_P12_Spring16) (08/15/2016) **Faculty Assessment Leader:** Susana Prieto **Faculty Contributing to Assessment:** Susan Stolovy **Related Documents:** SLO#3_P12_Spring16.docx	**Action:** Instructors quiz students before performing a lab to make sure they come prepared for that lab. Include the grades on a quiz given by the instructor on the next SLO#3 for this course. (09/01/2020) **Action Category:** SLO/PLO Assessment Process

ECC: PHYS 1A:Mechanics of Solids

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Applying Relevant Principles - Students can recognize the basic physical principles which are relevant in a given physical situation involving mechanics in order to correctly answer conceptual questions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A quiz consisting of multiple choice questions will be given to the class. Refer to "SLO#1_ PHYS 1A_ Sp 14_QUIZ.docx" **Standard and Target for Success:** Students will earn a score of 50% or better. **Related Documents:** SLO#1_ PHYS 1A_ Sp 14_QUIZ.docx		
SLO #2 Solving Physics Problems - Students can identify and apply the relevant laws of physics along with the necessary mathematics to successfully solve a mechanics problem. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A problem involving forces and acceleration will be assigned on an exam. The problem will be analyzed according to a rubric described in the attached document in the Results part of this report. **Standard and Target for Success:** 50% of the students will earn a score of 5/10 or higher.		
SLO #3 Data Collection & Analysis - Students can read and record, with appropriate units and uncertainties, measurements taken from a Vernier caliper and a micrometer caliper. Students can interpret and analyze the collected data, including error analysis. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/08/2013	**Laboratory Project/Report -** As part of a lab quiz, each student will be provided with an aluminum cylinder and asked to record with appropriate units and uncertainties the following: a) The length of the cylinder in inches, measured with an English micrometer. (1 pt) b) The length of the cylinder converted from inches (part a) to centimeters. (1 pt) c) The diameter of the cylinder measured using a metric micrometer. (1 pt)	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Overall 63% of students earned a grade of 3.0 or higher for this SLO. This exceeds our benchmark of 60% of students earning a grade of 5.0 or higher on this SLO. See attached document (SLO#3_P1A_Spring16) for more information. (08/14/2016) **Faculty Assessment Leader:** Susana Prieto **Faculty Contributing to Assessment:** Eyal Goldmann and Norm Kadomoto **Related Documents:** SLO#3_P1A_Spring16.docx	**Action:** Teachers will offer a brief review on the use of measuring devices and on the correct way of reporting data during a lab session of Physics 1B, 1C and/or 1D, as needed. (09/01/2018) **Action Category:** Teaching Strategies

Course SLOs	Assessment Method Description	Results	Actions
	d) The calculated cross sectional area of the cylinder. (1 pt) e) The calculated volume of the cylinder. (1 pt) Students will earn a score of between 0 and 5. Each correct answer will be worth a maximum of 1 point. The final score of each student will be rounded to a whole number of between 0 and 5. **Standard and Target for Success:** It is expected that 60% of the students will earn a score of between 3 and 5.		

ECC: PHYS 1B:Fluids, Heat and Sound

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Applying Relevant Principles - Students can recognize the basic physical principles which are relevant in a given physical situation involving heat, fluids or sound in order to correctly answer conceptual questions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A quiz consisting of multiple choice questions will be given to the class. (SLO#1_ PHYS 1B_ Sp 14_QUIZ.doc) **Standard and Target for Success:** Students will earn a score of 50% or better. **Related Documents:** SLO#1_ PHYS 1B_ Sp 14_QUIZ.doc		
SLO #2 Solving Physics Problems - Students can identify and apply the laws of physics along with the necessary mathematics to successfully solve a problem dealing with heat, fluids or sound. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** Given a description of a sequence of connected ideal-gas processes operating as an engine, construct a PV diagram for the cycle and determine the state of the gas at specified points on the cycle. Indicate where heat enters and leaves the cycle, and calculate the cycle's thermodynamic efficiency. **Standard and Target for Success:** 50% of the students will earn a score of 5/10 or better.		
SLO #3 Data Collection & Analysis - Students can read and record, with appropriate units and uncertainties, measurements taken from an instrument used to measure temperatures, densities or pressures. Students can interpret and analyze that data, including error analysis. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/08/2013	**Laboratory Project/Report -** As part of a lab assignment, students measured the force of tension on a submerged object as it was raised out of two different liquids to determine the buoyant force due to each liquid, the surface tension due to the liquid and finally the force on the object due simply to the force of gravity. Students were then tasked to present the results of force versus distance for both fluids in graphical	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Overall 64% of students earned a grade of 3.0 or higher for this SLO. This exceeds our benchmark of 60% of students earning a grade of 60% or higher on this SLO. The average grade was 71%. See related document (SLO#3_P1B_Spring16) (08/16/2016) **Faculty Assessment Leader:** Susana Prieto **Faculty Contributing to Assessment:** John Coroneus **Related Documents:**	**Action:** Use a different lab next time this SLO is assessed. (09/01/2020) **Action Category:** SLO/PLO Assessment Process

Course SLOs	Assessment Method Description	Results	Actions
	form and clearly show the different regions – purely buoyant, transition, purely surface tension and then normal gravity. From these graphs, students determined the density of the object and the surface tension of each liquid. In a second part of the lab, students were tasked with making Helium balloons neutral buoyant then estimate balloon volume and then experimentally determine the density of air in the room. 50 students in two sections of physics 1B completed this laboratory and turned in reports that were graded. Grading focused on student ability to correctly measure the force on a sensitive scale and correctly determine the density of the object as well as the surface tension of the two fluids. Particular attention was paid to appropriate presentation of the data in graphical form. Students were also graded on their experimental determination of the density of air in the room. **Standard and Target for Success:** It is expected that 60% of the students will earn a score of 60% or higher.	SLO#3_P1B_Spring16.docx	

ECC: PHYS 1C:Electricity and Magnetism

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Applying Relevant Principles - Students can recognize the basic physical principles which are relevant in a given physical situation involving electricity, magnetism or electromagnetism in order to correctly answer conceptual questions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A quiz consisting of multiple choice questions will be given to the class. "SLO#1_ PHYS 1C_ Sp 14_QUIZ.docx". **Standard and Target for Success:** Students will earn a score of 50% or better. **Related Documents:** SLO#1_ PHYS 1C_ Sp 14_QUIZ.docx		
SLO #2 Solving Physics Problems - Students can identify and apply the relevant laws of physics along with the necessary mathematics to successfully solve a problem dealing with electricity, magnetism or electromagnetism. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** The following problem was assigned to students: Two small identical conducting balls of mass of mass 4.1666 grams are suspended by light 1.0000 m-long strings which are fixed at a point. The string initially makes an angle of 36.870o with the vertical. When the two balls are touched together and released, the new angle between each string and the vertical is 44.595o. (Use g = 10.000 m/s2). (a) Draw the FBD of either ball. (b) Write the force equations. (c) Find the final charge, Q, on each ball. (d) Find the initial charge on each ball. (Assume q1 is larger than q2). Use 5 significant figures for this problem.		

Course SLOs	Assessment Method Description	Results	Actions
	Standard and Target for Success: 50% of the students will earn a score of 5/10 or better.		
SLO #3 Data Collection & Analysis - Students can read and record, with appropriate units and uncertainties, measurements taken from a multimeter and a voltmeter. Students can interpret and analyze that data, including error analysis. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/08/2013	**Laboratory Project/Report -** As part of a lab assignment, students will build circuits and use bridge methods in different configurations to determine the value of unknown resistors and potentials. This will be accomplished by reading an ammeter and simultaneously varying the ratio between two known resistors until a zero current is obtained. In the first part of the laboratory, students will use Ohm's law to relate various voltages and currents in the circuit, then combine this knowledge together with the ratio mentioned above and a third, known resistance to determine the value of an unknown resistor. In the second part of the laboratory, the third resistor is replaced with a known potential and students will again use bridge methods to determine the value of an unknown potential. In all cases, proper attention will be paid to uncertainties in the data and the effect of the uncertainties on the calculated result. **Standard and Target for Success:** It is expected that 60% of the	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Overall 98% of students earned a grade of 60% or higher for this SLO. This exceeds our benchmark of 60% of students earning a grade of 60% or higher on this SLO. The average grade for all students was 83%. See related document for more information (SLO#3_P1C_Spring16) (08/16/2016) **Faculty Assessment Leader:** Susana Prieto **Faculty Contributing to Assessment:** John Coroneus **Related Documents:** SLO#3_P1C_Spring16.docx	**Action:** Use a different lab next time this SLO is assessed. (09/01/2020) **Action Category:** SLO/PLO Assessment Process

Course SLOs	Assessment Method Description	Results	Actions
	students will earn a grade of 60% or higher on this SLO.		

ECC: PHYS 1D:Optics and Modern Physics

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Applying Relevant Principles - Students can recognize the basic physical principles which are relevant in a given physical situation involving optics or modern physics in order to correctly answer conceptual questions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A quiz was given to the class with five multiple choice questions. The questions were conceptual in nature. Each question required the use of a relevant physical principle in order to arrive at the correct answer. **Standard and Target for Success:** Average score of 50%. **Related Documents:** Physics 1D SLO Evaluation.docx		
SLO #2 Solving Physics Problems - Students can identify and apply the relevant laws of physics along with the necessary mathematics to successfully solve a problem dealing with optics or modern physics. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** The following problem will be assigned to all students participating in this SLO: Unpolarized light with intensity I0 = 2.0 W/cm2 is incident on a stack of three polarizers. The first and third polarizers in the stack have transmission axes which are perpendicular to each other. There is an angle ? between the transmission axis of the first polarizer and the transmission axis of the second polarizer. The light exiting the third polarizer has intensity 0.15 W/cm2. (a) Draw a picture illustrating this situation. Show the electric field direction of the light exiting each of the polarizers. (b) Find ?. (HINT: Even though you may be tempted use the root finder on your calculator to solve this problem, you do not need it. You will not receive full credit for this		

Course SLOs	Assessment Method Description	Results	Actions
	problem if you use your root finder. Try to use trig identities instead.) The problem will be graded on a scale ranging from 0 to 10. The results are shown below: **Standard and Target for Success:** 50% of students will earn a grade of 5/10 or higher		
SLO #3 Data Collection & Analysis - Students can read and record, with appropriate units and uncertainties, measurements taken from an instrument used in an optics lab.. Students can interpret and analyze the collected data, including error analysis. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/08/2013	**Laboratory Project/Report -** As part of a lab assignment students will be asked to use a protractor to measure and record with appropriate units and uncertainties the angle of incidence and the angle of refraction of a ray passing across a boundary from a transparent medium to air. Students will be asked to use the obtained measurements of the angles and compute and record with appropriate uncertainties the index of refraction of the medium. Students use a shallow container and focus a traveling telescope at the bottom of the container, water is then added to the container, and the telescope is then focused at the perceived bottom of the container and then at the surface of water. Students will be asked to read the three telescope settings and record the settings with appropriate units and uncertainties. Students will be asked to use the readings of those settings to compute the index of refraction of water and to record the	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Overall 72% of students earned a grade of 6 or higher for this SLO. This exceeds our benchmark of 60% of students earning a grade of 6 or higher on this SLO. For more information see related document (SLO#3_P1D_Spring 16) (08/27/2016) **Faculty Assessment Leader:** Susana Prieto **Faculty Contributing to Assessment:** E. Goldmann **Related Documents:** SLO#3_P1D_Spring16.docx	**Action:** Use another lab the next time this SLO is assessed. (09/01/2020) **Action Category:** SLO/PLO Assessment Process

Course SLOs	Assessment Method Description	Results	Actions
	value of the index of refraction with appropriate uncertainties. Students will earn a grade of between 1 and 10. **Standard and Target for Success:** It is expected that 60% of students earning a grade of 6 or higher on this SLO.		

ECC: PHYS 2A:General Physics

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Applying Relevant Principles - Students can identify the physical principles which are relevant in a given physical situation involving mechanics, heat, fluids or sound in order to correctly answer conceptual questions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A quiz consisting of multiple choice questions will be given to the class. See attached document (SLO#1_ PHYS 2A_ Sp 14_QUIZ.docx). **Standard and Target for Success:** Students will earn a score of 50% or better. **Related Documents:** SLO#1_ PHYS 2A_ Sp 14_QUIZ.docx		
SLO #2 Solving Physics Problems - Students can identify and apply the relevant laws of physics along with the necessary mathematics to successfully solve a mechanics problem. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A problem involving forces and acceleration will be assigned on an exam. The problem will be analyzed according to a rubric described in the Results part of this report. **Standard and Target for Success:** 50% of the students will score at least 5/10 points on the assessment. **Related Documents:** SLO_Phys2a_problem_solving.docx		
SLO #3 Data Collection & Analysis - Students demonstrate ability to correctly read and record, with appropriate units and uncertainties, measurements taken from a vernier caliper and a micrometer caliper. Students can interpret and analyze the collected data, including error analysis. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/08/2013	**Laboratory Project/Report -** As part of a measurement lab, students will read and record, with appropriate units and uncertainties, measurements taken from a vernier caliper a micrometer caliper and a scale of a graduated cylinder and an aluminum cylinder. Students will be asked to perform mathematical operations using these measurements in order to calculate areas, volumes, thicknesses and densities and to record the results with appropriate unis and	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Overall 97% of students earned a grade of 6.0 or higher on this SLO. This exceeds our benchmark of 70% of students earning a grade of 6.0 or higher. For more information see attached document (SLO#3_P2A_Spring16) (08/14/2016) **Faculty Assessment Leader:** Susana Prieto **Faculty Contributing to Assessment:** Razmic Shirvanian, Susan Stolovy, Kyle Strohmaier. **Related Documents:** SLO#3_P2A_Spring16.docx	**Action:** Report the average grade for this SLO of all students next time this SLO is assessed. (09/01/2020) **Action Category:** SLO/PLO Assessment Process

Course SLOs	Assessment Method Description	Results	Actions
	uncertainties. **Standard and Target for Success:** It is expected that 60% of students earning a grade of 6.0 or higher on this SLO.		

ECC: PHYS 2B:General Physics

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Applying Relevant Principles - Students can identify the physical principles which are relevant in a given physical situation involving electricity, magnetism, electromagnetism, optics or modern physics in order to correctly answer conceptual questions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A quiz consisting of multiple choice questions will be given to the class. **Standard and Target for Success:** Students will earn a score of 50% or better. **Related Documents:** SLO#1_ PHYS 2B_ Sp 14_QUIZ.docx		
SLO #2 Solving Physics Problems - Students can identify and apply the relevant laws of physics along with the necessary mathematics to successfully solve a problem dealing with electricity, magnetism, electromagnetism, optics or modern physics. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A Geometrical Optics problem will be assigned on an exam. The problem will be analyzed according to a rubric described in the Results part of this report. **Standard and Target for Success:** 50% of the students will earn a score of 5/10 or better		
SLO #3 Data Collection & Analysis - Students can read and record, with appropriate units and uncertainties, measurements taken from a multimeter. Students can interpret and analyze that data, including error analysis. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/08/2013	**Laboratory Project/Report -** As part of a lab, students will be asked to connect three or more resistors of known resistance, a) in series, b) in parallel and c) in combinations of series and parallel arrangements. Students will be asked to predict and then use a multimeter to measure the voltage across each resistor and the current flowing through each of the resistors in all of the circuits built. Students will then be asked to	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Overall 96% of the students earned a grade of 3 or higher on this SLO. This exceeds our benchmark of 70% of students earning a grade of 3 or higher on this SLO. One of the reasons students did well on this SLO is that the instructor required students to check their circuits with him. This is reasonable since many students have difficulty interpreting the resistor diagrams provided in the lab. Also, students often find it difficult to correctly connect the	**Action:** Use an optics lab next time SLO#3 is assessed. (09/01/2020) **Action Category:** SLO/PLO Assessment Process

Course SLOs	Assessment Method Description	Results	Actions
	report the results of their measurements and predicted values with appropriate units and significant figures and to determine, when appropriate, the percent difference between the calculated and the predicted values. **Standard and Target for Success:** It is expected that 60% of students earning a grade of 3 or higher on this SLO.	multimeters. for more information see related document (SLO#3_P2B_Spring16) (08/15/2016) **Faculty Assessment Leader:** Susana Prieto **Faculty Contributing to Assessment:** Zeke Murdock **Related Documents:** SLO#3_P2B_Spring16.docx	

ECC: PHYS 3A:General Physics With Calculus

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Applying Relevant Principles - Students can identify the physical principles which are relevant in a given physical situation involving mechanics, heat, fluids or sound in order to correctly answer conceptual questions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A quiz consisting of multiple choice questions will be given to the class. See attached document (SLO#1_PHYS3A_Sp_14_QUIZ.docx). **Standard and Target for Success:** Students will earn a score of 50% or better. **Related Documents:** SLO#1_ PHYS 3A_ Sp 14_QUIZ.docx		
SLO #2 Solving Physics Problems - Students can identify and apply the relevant laws of physics along with the necessary mathematics to successfully solve a mechanics problem. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A problem involving forces and an acceleration will be assigned on an exam. The problem will be analyzed according to a rubric described in the Results part of this report. **Standard and Target for Success:** 50% of the students will score at least 5/10 points on the assessment.		
SLO #3 Data Collection & Analysis - Students can read and record, with appropriate units and uncertainties, measurements taken from a Vernier caliper and a micrometer caliper. Students can interpret and analyze that data, including error analysis. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/08/2013	**Laboratory Project/Report -** As part of a measurement lab, students will read and record, with appropriate units and uncertainties, measurements taken from a vernier caliper a micrometer caliper and a scale of a graduated cylinder and an aluminum cylinder. Students will be asked to perform mathematical operations using these measurements in order to calculate areas, volumes, thicknesses and densities and to record the results with appropriate unis and uncertainties.	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Overall 86% of students earned a grade of 6.0 or higher on this SLO. This exceeds our benchmark of 70% of students earning a grade of 6.0 or higher on this SLO. For more information see related document (SLO#3_P3A_Spring16 (09/18/2016) **Faculty Assessment Leader:** Susana Prieto **Faculty Contributing to Assessment:** N. Lev **Related Documents:** SLO#3_P3A_Spring16.docx	**Action:** Use a different lab next time this SLO is assessed. (09/01/2020) **Action Category:** SLO/PLO Assessment Process

Course SLOs	Assessment Method Description	Results	Actions
	Standard and Target for Success: It is expected that 70% of students earning a grade of 6.0 or higher on this SLO.		

ECC: PHYS 3B:General Physics With Calculus

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Applying Relevant Principles - Students can recognize the physical principles of which are relevant in a given physical situation involving electricity, magnetism, electromagnetism, optics or modern physic in order to correctly answer conceptual questions. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** A quiz consisting of multiple choice questions will be given to the class. **Standard and Target for Success:** Students will earn a score of 50% or better.		
SLO #2 Solving Physics Problems - Students can identify and apply the laws of physics along with the necessary mathematics to successfully solve a problem dealing with electricity, magnetism, electromagnetism, optics or modern physics. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/08/2013	**Exam/Test/Quiz -** The following problem will be assigned to all students participating in this SLO: If the intensity of sunlight reaching the Earth is 1361 W/m2, (a) what are the electric and magnetic field oscillation magnitudes of the sunlight? (b) How much energy is contained within a beam of sunlight 100 m long and a cross sectional area of 5.0 m2? (c) How much force does the sunlight impart on a 2000 m2 surface oriented perpendicular to the surface? (d) If the sunlight is absorbed upon impact on the surface of part c, what is the momentum of 1.0 second worth of sunlight when it impacts the 2000 m2 surface? **Standard and Target for Success:** 50% of the students will score at least 5/10 points on the assessment.		

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #3 Data Collection & Analysis - Students can read and record, with appropriate units and uncertainties, measurements taken from a multimeter. Students can interpret and analyze that data, including error analysis. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/08/2013	**Laboratory Project/Report -** As part of a lab, students will be asked to connect three or more resistors of known resistance, a) in series, b) in parallel and c) in combinations of series and parallel arrangements. Students will be asked to predict and then use a multimeter to measure the voltage across each resistor and the current flowing through each of the resistors in all of the circuits built. Students will then be asked to report the results of their measurements and predicted values with appropriate units and significant figures and to determine, when appropriate, the percent difference between the calculated and the predicted values. **Standard and Target for Success:** It is expected that of 60% of students will earn a grade of 3 or higher on this SLO.	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Every student earned a grade of 3 or higher on this SLO. This exceeds our benchmark of 70% of students earning a grade of 3 or higher on this SLO. One of the reasons students did well on this SLO is that the instructor required students to check their circuits with her. This is reasonable since many students have difficulty interpreting the resistor diagrams provided in the lab. Also, students often find it difficult to correctly connect the multimeters. For more information see related document (SLO#3_P3B_Spring16) (08/15/2016) **Faculty Assessment Leader:** Susana Prieto **Faculty Contributing to Assessment:** Naltalya Lev **Related Documents:** SLO#3_P3B_Spring16.docx	**Action:** Use a lab dealing with optics next time this SLO is assessed. (09/01/2020) **Action Category:** SLO/PLO Assessment Process