Assessment: Course Four Column

SPRING / SUMMER 2016

El Camino: Course SLOs (NSC) - Astronomy

ECC: ASTR 12:Astronomy Laboratory

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Scientific Method - Students will be able to apply the Scientific Method to the solution of astronomical problems. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Fall 2014) **Input Date:** 11/12/2013	**Exam/Test/Quiz -** Using a drawing of Jupiter and its Galilean satellites, students need to identify the satellites by name and explain their reasoning based on size, color, and distance. **Standard and Target for Success:** 4 points will be given. 1/2 point for each correct identification and 1/2 point for each correct explanation. It is expected 80% of the students receive at least 3 points.	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Not Met Two professors assessed the SLO. Professor A / Professor B Total students: 26 / 28 at least 3 points: 14 (53.8%) / 3 (11%) Breakdown by points 4 points: 7 (27%) / 2 (7%) 3.5 points: 3 (12%) / 0 (0%) 3 points: 4 (15%) / 1 (3.5%) 2.5 points: 0 (0%) / 0 (0%) 2 points: 5 (19%) / 4 (14%) 1.5 points: 3 (12%) / 1 (3.5%) 1 point: 1 (4%) / 3 (11%) 0.5 points: 3 (12%) / 7 (25%) 0 points: 0 (0%) / 10 (36%) The percentages are very low, especially for Professor B. It was professor B's first time teaching Astronomy 12 and did not realize what content to stress and cover with importance. Professor A needed 7 more students in order to meet the standard. Both professors' results indicate a need for improvement. The SLO was given on the final week, while the lab for	**Action:** Emphasizing to the students the importance in noting details and understanding what they are observing would greatly improve the results. The students may have been able to identify the images at the time, but may not have had a thorough understanding of the reasons for the identification. The students may have copied their peers or guessed. So instead of just identifying the objects, noting reasons would be helpful. Also, including questions from previous labs week-after-week can help the retention rates. (09/16/2017) **Action Category:** Teaching Strategies

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		Jupiter was performed much earlier. Perhaps the retention rate is reflected more in the results. Professor B had many students who forgot the names of Jupiter's moons. (09/17/2016) **Faculty Assessment Leader:** Shimonee Kadakia **Faculty Contributing to Assessment:** Perry Hacking	
SLO #2 Locating Celestial Objects - Using a Cassegrain reflecting telescope, students will be able to align the telescope and point it at several objects, including the Moon, planets visible to the naked eye, planets invisible to the naked eye, bright stars, faint stars, and diffuse objects (clusters, nebulae, and galaxies). **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/12/2013	**Exam/Test/Quiz -** Students will polar align a telescope, set up the appropriate camera and obtain an image of a celestial object given its name. This version is new as of Spring 2016. **Standard and Target for Success:** 70% of students achieve a score of 7.5 or better.	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Met Spring 2015 Palmer (score - # of students): 10 - 20, 9 - 5, 8 - 3, 6 - 2. N = 30, Mean 9.4, SD - very small Hacking: 11 - 1, 10 - 1, 9 - 3, 8.5 - 6, 8 - 5, 7.5 - 2, 7 - 4, 6.5 - 1, 6 - 3, 5.5 - 1, 5 - 1, 4.5 - 2. N = 30, Mean 7.53, SD = 1.55 Overall, 77% of the students achieved a score of 7.5 or higher which meets the target for success. A very high proportion of Palmer's students met the criterion. 60% of Hacking's students met it. This discrepancy is largely due to the nature of the two exams from the two instructors. Hacking's students used the manual telescopes while Palmer's used the computerized ones. The exam was not really the right one for the latter telescopes. The scores are based upon the student's ability to locate a celestial object and how close they came to it. So there are not multiple questions or tasks to this exam. The scores presented are for that single task. The new telescopes are all computerized so the exam has changed as can be seen in its description. The new test now involves use of high-performance cameras. Fall 2015 Palmer (score - # of students): 10 - 24, 9 - 1, 0 - 1. N = 26, Mean = 9.6, SD = very small. Hacking: 11 - 4, 10 - 3, 9 - 8, 8.5 - 2, 8 - 3, 7.5 - 1, 7 - 1. N = 22, Mean = 9.2, SD = 1.2	**Action:** We have received new telescopes so a new assessment needs to be developed. (12/17/2016) **Action Category:** SLO/PLO Assessment Process

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		96% of the students achieved a score of 7.5 or above, which was way beyond the target set for success. Both Hacking and Palmer's sections achieved the target. Hacking's section was most improved, and this was largely due to extra emphasis placed on practicing for this exam during the semester. It was also a stronger class academically. These scores are for the student's ability to polar align and locate a celestial object in the telescope. There are not multiple parts to the question. The new equipment is now all computerized and the assessment has changed to reflect that along with the use of high performance cameras. (02/17/2016) **Faculty Assessment Leader:** Perry Hacking **Faculty Contributing to Assessment:** Leon Palmar	

ECC: ASTR 13:Astronomical Optics

Course SLOs	*Assessment Method Description*	*Results*	*Actions*
SLO #1 Optical Surfaces - The student will understand and apply the principles of testing optical surfaces. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/12/2013 **Comments::** Changed SLO statement based on forwarded e-mail from Russell Serr on 09.22.2016 (SLO Name/Title remains the same.)	**Homework Problems -** A homework assignment with questions referring to testing optical surfaces is given towards the latter half of the semester. The homework consists of 6 short answer questions. It is attached. **Standard and Target for Success:** It is expected that 90% of the students receive a 85% or better on the homework set. **Related Documents:** Homework 2.doc	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Not Met Only one class of Astronomy 13. Total students: 14 Students received 85% or higher: 8 (57%) Students who did not do the homework: 2 (14%) Students between 0% and 85%: 4 (29%) These are low number statistics, however it should be expected more students complete the homework. Some of the low scores were due to incomplete work rather than incorrect answers. Since the class goal is to complete a polished mirror, it is essential students understand optical surfaces and the testing methods. (09/16/2016) **Faculty Assessment Leader:** Shimonee Kadakia	**Action:** One main issue was data analysis using a graph the students constructed. Reiterating or conducting more examples during lecture can help provide clarification on how to use the graph. In terms of improving percent of complete assignments, perhaps making a part or all of it a quiz may provide an urgency in showing understanding. Another idea would be to have an interactive worksheet involving the necessary material in lecture where the students would demonstrate their knowledge among their peers, which could make them realize what they need to better understand. In order for a student to have a completed, polished mirror he/she would need to understand the content in the homework assignment by the end of the semester, so the worry would be having the students understand the content sooner than later. (09/16/2017) **Action Category:** Teaching Strategies **Action:** SLO statement needs to be changed to: SLO #1 Optical Surfaces The student will understand and apply the principles of testing optical surfaces. The current SLO statement is for Astronomy 12. (09/01/2017)

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Action Category: SLO/PLO Assessment Process

ECC: ASTR 25:Stars and Galaxies

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SLO #1 Scientific Method - Students will be able to recognize the elements of the Scientific Method in the discussion of a scientific problem. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2013-14 (Spring 2014) **Input Date:** 11/12/2013	**Essay/Written Assignment -** The student will be given a popular science article about an observation or experiment. The student will identify the researchers' hypotheses, theoretical predictions, observations or experiments, and conclusions. **Standard and Target for Success:** Rubric: 1 point for correctly identifying the hypotheses 1 point " " " the prediction to be tested 1 point " " " the experimental result or observation 1 point " " " a reasonable conclusion based on the results 4 points: Excellent 3 points: Good 2 points: Fair 1 point: Poor Target: 75% or more score 3 or 4.		
SLO #2 EM Radiation - Students will explain how electromagnetic radiation and astronomical instruments are used to reveal the properties of stars and planets. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2015-16 (Spring 2016) **Input Date:** 11/12/2013	**Exam/Test/Quiz -** Four multiple-choice questions are given. The questions are based on black body diagrams for four stars that vary in temperatures and sizes. The assessment is given typically towards the end of the semester as part of an exam. For each question, it is calculated what percent of total assessed students gave the correct answer. The assessment is attached.	**Semester and Year Assessment Conducted:** 2015-16 (Spring 2016) **Standard Met? :** Standard Not Met The number of students as well as the percentage who answered each question correctly is shown Prof. A Prof. B Combined total students: 61 22 15 76 date assessed: Final Exam Quiz 4 Exam 4	**Action:** It may be necessary to change the assessment question or add questions. Since the assessment is based on graphs, adding a few questions on how well the students understand/ read the graph may be important for us in distinguishing if the students have issues with understanding the material or a difficult time

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	Standard and Target for Success: It is expected that 80% of students answer each question correctly. **Related Documents:** A25.EMradiatn.pdf	Question 1 57 (93.4%) 18 (81.8%) 14 (93.3%) 93.4% correct of total assessed Question 2 24 (39.3%) 17 (77.3%) 12 (80%) 47.3% correct of total assessed Question 3 38 (62.3%) 19 (86.4%) 13 (86.7%) 67% correct of total assessed Question 4 39 (63.9%) 20 (90.9%) 15 (100%) 71% correct of total assessed Professor B assessed the students twice, but exhibits low number statistics. Professor A assessed the students once. Both professors obtained the same pattern in their results. Question 2 received the lowest percentage correct, while question 1 was well-above the standard. The questions are based on a diagram. The diagram may not be well understood or the questions may not be read correctly. Professor A noted many students did not try question 4 perhaps because it was on the other side of the paper and the students did not flip the page. (09/05/2016) **Faculty Assessment Leader:** Shimonee Kadakia **Faculty Contributing to Assessment:** Vincent Lloyd	understanding the graph. The graphs used for the assessment are seen during lectures, however there are other graphs that represent the same content which may be easier for the students to understand and follow, such as the HR diagram. Replacing the current graph with an HR diagram may offer better and clearer results. (09/16/2017) **Action Category:** SLO/PLO Assessment Process **Action:** Repetition and emphasize on the material are necessary. The content is new to most students and the diagram is also not intuitive, so perhaps testing them multiple times as professor B did would be beneficial. Professor B includes the content via interactive worksheets (Black body radiation and Luminosity, radius, and Temperature relationship) from Lecture Tutorials during class. Exposing the students to the material and graphs/diagrams frequently may lead to better results. (09/16/2017) **Action Category:** Teaching Strategies
SLO #3 Universe Origin - Students will be able to describe the modern theory of the origin of the universe (the Big Bang Theory) and discuss the evidence that supports the theory. **Course SLO Status:** Active **Course SLO Assessment Cycle:** 2014-15 (Spring 2015) **Input Date:** 11/12/2013	**Essay/Written Assignment -** Assessment In a short essay, describe the Big Bang Theory. Discuss the major observations that are explained by the theory.		

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	Rubric 4 points: The student's explanation includes a description of the origin of the Universe in a hot, dense state and the formation of matter from pair production. The student shows understanding of the evidence for the Big Bang from the cosmic abundance of helium, the evolutionary changes in galaxies, and the Cosmic Microwave Background. 3 points: The Big Bang is well-described. One piece of evidence is well-explained. 2 points. The Big Bang Theory is fairly well described, but no supporting evidence is mentioned. 1 point. The student shows some understanding that the Universe began in a hot, dense state. No supporting evidence is presented. **Standard and Target for Success:** It is expected that 70% or more of students will score 3 or 4 on this SLO. **Related Documents:** BigBang.Spr2015.A25.pdf		