2017-2018 Annual Assessment Report

Department of Physics

BS Physics

October 1st, 2018

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| **Department and Degree: Physics BS****Assessment Coordinator: Doug Singleton and Yongsheng Gao**1. **What learning outcome(s) did you assess this year?** List all program outcomes you assessed (if you assessed an outcome not listed on your department SOAP please indicate explain). Do not describe the measures or benchmarks in this section Also please only describe major assessment activities in this report. No GE assessment was required for the 2016-2017 academic year.

The SLOs addressed during this cycle of assessment were 1.1 and 3.1SLO: 1.1SLO: 3.1 |
| 1. **What assignment or survey did you use to assess the outcomes and what method (criteria or rubric) did you use to evaluate the assignment?** If the assignment (activity, survey, etc.) does not correspond to the activities indicated in the timeline on the SOAP, please indicate why. Please clearly indicate how the assignment/survey is able to measure a specific outcome. If after evaluating the assessment you concluded that the measure was not clearly aligned or did not adequately measure the outcome please discuss this in your report. Please include the benchmark or standard for student performance in your assessment report (if it is stated in your SOAP then this information can just be copied into the report). An example of an expectation or standard would be “On outcome 2.3 we expected at least 80% of students to achieve a score of 3 or above on the rubric.”

The assessment activity performed during the 2017-2018 cycle, and which we used to assess SLO 1.1 and 3.1, was to have upper division students take the Physics Major Field Test (MFT) as part of the required course, Physics 115, Quantum Mechanics. The MFT is a product of Educational Testing Services (ETS). According to the ETS website, “ETS offers comprehensive national comparative data for the Major Field Tests, enabling you to evaluate your students' performance and compare your program's effectiveness to programs at similar institutions nationwide.” Four upper division undergraduate students took the Physics MFT. The criteria that we used to assess if the students satisfied the assessment is that the students would score at or above the median score. The median score for 2017-2018 corresponded to the 47th percentile. The results of the Physics MFT for the four students are given in the table below Score Percentile Score 1 Score 2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student #1 |  | 157 |  **67** |  | 54 |  61 |
| Student #2 |  |  149 | **47** |  | 35 | 68 |
| Student #3 |  |  144 | **34** |  | 48 | 41 |
| Student #4 |  |  125 |  **2** |  | 26 | 27 |
|  |  |  |  |  |  |  |

Score 1 refers to introductory material and Score 2 refers to advanced material. From the above table two students met the requirement of scoring at the mean or above and two students did not meet the assessment mark.  |
| 1. **What did you discover from the data?** Discuss the student performance in relation to your standards or expectations. Be sure to clearly indicate how many students did (or did not) meet the standard for each outcome measured. Where possible, indicate the relative strengths and weaknesses in student performance on the outcome(s).

Given the low number of students taking the assessment, it is hard to draw definitive conclusions that have any statistical validity. The two students who met the mark of being at the mean or above had significantly better GPAs and had taken more advanced classes than the two students who did not meet the mark. The results for this assessment of having 50% of the students meet the mark is in line with previous times that the MFT assessment was given. One interesting point is the students often scores better on sub-score #2 (advanced material) as compared to sub-score #1 (introductory material). This is also in line with previous times the MFT assessment was done. The reason for this, we believe, is due to the fact that the upper division students have more recently taken advanced courses and thus do better on the advanced material as compared to introductory material.  |
| 1. **What changes did you make as a result of the data?** Describe how the information from the assessment activity was reviewed and what action was taken based on the analysis of the assessment data.

The assessment scores were reviewed by the coordinator and department chair, and were discussed with faculty. The low scores of two of the students indicate a weakness in problem solving at both the introductory and advanced level. One possible strategy to address the low scores of some of the students in the sub-scores #2 is to institute recitation/problem solving sessions in conjunction with upper division courses. However, there are workload issues and funding issues connected with this approach. We are looking into this. A possible strategy to address the low scores in sub-score #1 is to have our advanced students perform tutoring of lower division courses so they stay fresh with this material. Again, in this case there are funding issues (how would this be paid for?). We are looking into options for this i.e. having upper division physics students tutor for the lower division courses.  |
| 1. **What assessment activities will you be conducting in the 2018-2019 AY?** List the outcomes and measures or assessment activities you will use to evaluate them. These activities should be the same as those indicated on your current SOAP timeline; if they are not please explain.

Next year we will again use the Physics MFT as our assessment. According to the timeline, next year’s assessment should be to give the Force Concept Inventory (FCI) and Conceptual Survey of Electricity and Magnetism (CSEM) to Physics 4A and Physics 4Bclasses. However, it was realized that most of the students in these two courses are not physics majors and thus in terms of doing program assessment giving an assessment in these lower division courses does not serve the purpose of program review. Further Physics 4A is in GE area B1 and thus Physics 4A is assessed as part of the GE assessment. The department will discuss removing the two assessment methods – common finals and the FCI/CSEM – that focus on Physics 4A/4B since these do not really assess our program, but assess students in other programs (mostly engineering).  |
| 1. **What progress have you made on items from your last program review action plan?** Please provide a brief description of progress made on each item listed in the action plan. If no progress has been made on an action item, simply state “no progress.”

No progress on action items. **Additional Guidelines:** If you have not fully described the assignment then please attach a copy of the questions or assignment guidelines. If you are using a rubric and did not fully describe this rubric (or the criteria being used) than please attach a copy of the rubric. If you administered a survey please consider attaching a copy of the survey so that the Learning Assessment Team (LAT) can review the questions. |