Please submit report to your department chair or program coordinator, the Associate Dean of your College, and to james.solomon@csun.edu, director of assessment and program review, by September 30, 2015. You may, but are not required to, submit a separate report for each program, including graduate degree programs, which conducted assessment activities, or you may combine programs in a single report. Please identify your department/program in the file name for your report.
College: Science and Math.
Department: Physics and Astronomy
Program: Physics and Astronomy
Assessment liaison: Radha Ranganathan

1. Please check off whichever is applicable:
   A. ______ Measured student work.
   B. ___X___ Analyzed results of measurement.
   C. ___X___ Applied results of analysis to program review/curriculum/review/revision.

2. Overview of Annual Assessment Project(s). On a separate sheet, provide a brief overview of this year’s assessment activities, including:
   • an explanation for why your department chose the assessment activities (measurement, analysis, and/or application) that it enacted
   • if your department implemented assessment option A, identify which program SLOs were assessed (please identify the SLOs in full), in which classes and/or contexts, what assessment instruments were used and the methodology employed, the resulting scores, and the relation between this year’s measure of student work and that of past years: (include as an appendix any and all relevant materials that you wish to include)
   • if your department implemented assessment option B, identify what conclusions were drawn from the analysis of measured results, what changes to the program were planned in response, and the relation between this year’s analyses and past and future assessment activities
   • if your department implemented option C, identify the program modifications that were adopted, and the relation between program modifications and past and future assessment activities
• in what way(s) your assessment activities may reflect the university’s commitment to diversity in all its dimensions but especially with respect to underrepresented groups

• any other assessment-related information you wish to include, including SLO revision (especially to ensure continuing alignment between program course offerings and both program and university student learning outcomes), and/or the creation and modification of new assessment instruments

3. **Preview of planned assessment activities for next year.** Include a brief description and explanation of how next year’s assessment will contribute to a continuous program of ongoing assessment.
2. Overview of Annual Assessment Project(s).
A. The main assessment instrument has been the ETS tests that our students are asked to take at the end of their senior year. Four students took this test in Spring 2015. Results and comparison with those for the nation are summarized in the two Tables below.

Data that included 1,907 seniors from domestic institutions who tested between September 2012 and June 2015 is presented below:

<table>
<thead>
<tr>
<th>Number of Seniors</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
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</thead>
<tbody>
<tr>
<td>1,907</td>
<td>150.6</td>
<td>149.0</td>
<td>15.4</td>
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</table>

Data for CSUN seniors who tested in Spring 2015

<table>
<thead>
<tr>
<th>Number of Seniors</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>146</td>
<td>147.0</td>
<td>8</td>
</tr>
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</table>

The average score of our students 146/200 with a standard deviation of 8 is in the 39th percentile of the national average with a percentile range of 19 to 60%. Averages and other statistical quantities are not useful when the number of students, in our case 4, is small. However this is an opportunity to examine individual student scores. Correlation and patterns may then emerge to show what particular student behavior and choices influence student performance. In the previous year, two students that performed above average in the introductory part of the test were Peer Learning Facilitators (PLF). This year the student who performed best was also a PLF for two semesters and also conducted a senior thesis project. It is quite likely that their tutoring responsibilities helped them in learning as well. Furthermore research experience fosters in-depth analytical thinking which makes the student more confident and comfortable with thinking through a problem. This reasonable correlation is well worth exploring. The department will continue to offer such opportunities including tutoring and research to students and the assessment committee will explore this correlation.

B. The ETS test addresses the following SLOs

1. Demonstrate knowledge of physical principles used to model natural phenomena.

2. Demonstrate ability to convey physical concepts with mathematical expressions, and effectively derive quantitative predictions from a model through mathematical analysis.

The second SLO is not completely assessed by ETS tests. Exams and home works in the individual courses continue to be the best methods for this SLO. In this context individual faculty members continue efforts to better engage students. Some faculty have reported that requiring pre-class preparation that counts for grade and in-class assignments have improved student alertness and engagement in the class room.
C. Our third SLO:
   3. Demonstrate understanding of scientific methodology, including:
      1. data collection from observations, setting up laboratory experiments and data collection from experiments,
      2. analysis of data,
      3. testing of a model or hypothesis by comparing with data.

is tested in two senior year courses: PHYS 465 and PHYS 466. Rubric for assessment in PHYS 465 is ready. Formalizing the assessment method is still not complete.

3. Preview of planned assessment activities for next year
A. The rubric prepared for assessment of SLO 3 (given in 2C above) may be found in the following page of this report. Assessment will be conducted in PHYS 465 this year.

B. The department committee has initiated discussion on the remaining SLOS:
   4. Demonstrate competency in using computer tools, including:
      1. use of software programs for data analysis and presentation,
      2. numerical analysis,
      3. computer simulations.
   
5. Demonstrate special knowledge of their subprogram.

6. Communicate clearly and articulately physical concepts, findings, and interpretations in oral presentations.

7. Acquire ability to write clear, organized and illustrated technical reports with proper references to previous work in the area.

One idea is to introduce a “Research Design and Methods” course. In this course, students will work on individual projects which have the possibility of testing all or some of the SLOS 4 to 7. Details of implementing this will need more discussion amongst faculty members and is the plan for the current year.
<table>
<thead>
<tr>
<th><strong>Phys 465 Assessment Rubric</strong></th>
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<tbody>
<tr>
<td><strong>Emerging (0-12 points)</strong></td>
</tr>
<tr>
<td><strong>1. Organization (20 points)</strong></td>
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<tr>
<td><strong>2. Topic Knowledge (20 points)</strong></td>
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<tr>
<td><strong>3. Audience Adaptation (20 points)</strong></td>
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<tr>
<td><strong>4. Language Use (Verbal Effectiveness) (20 points)</strong></td>
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<tr>
<td><strong>5. Delivery (Nonverbal Effectiveness) (20 points)</strong></td>
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</tbody>
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