2014-2015 Annual Program Assessment Report

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:

Number of Seniors	Mean	Median	Standard Deviation
1,907	150.6	149.0	15.4

Data for CSUN seniors who tested in Spring 2015

Number of Seniors	Mean	Median	Standard Deviation
4	146	147.0	8

The average score of our students 146/200 with a standard deviation of 8 is in the 39 th 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.

PHYS 465 Assessment Rubric

	Emerging (0-12 points)	**Developing** (13-16 points)	**Advanced** (17-20 points)	**Score**
1. Organization (20 points)	Ideas may not be focused or developed; the main purpose is not clear. The introduction is undeveloped. Main points are difficult to identify. Transitions may be needed. There is no conclusion or may not be clear the presentation has concluded. Conclusion does not tie back to the introduction. Audience cannot understand presentation because there is no sequence of information.	Main idea is evident, but the organizational structure many need to be strengthened; ideas may not clearly developed or always flow smoothly and the purpose is not clearly stated. The introduction may not be well developed. Main points are not clear. Transitions may be awkward. Supporting material may lack in development. The conclusion may need additional development. Audience has difficulty understanding the presentation because the sequence of information is unclear.	Ideas are clearly organized, developed, and supported to achieve a purpose; the purpose is clear. The introduction gets the attention of the audience and clearly states the specific purpose of the speech. Main points are clear and organized effectively. The conclusion is satisfying and relates back to introduction. (If the purpose of the presentation is to persuade, there is a clear action step identified and an overt call to action.)	
2. Topic Knowledge (20 points)	Student does not have grasp of information; student cannot answer questions about the subject. Few, if any, sources are cited. Citations are attributed incorrectly. Inaccurate, generalized, or inappropriate supporting material may be used. Over dependence on notes may be observed.	Student has a partial grasp of the information. Supporting material may lack in originality. Citations are generally introduced and attributed appropriately. Student is at ease with expected answers to all questions but fails to elaborate. Over dependence on notes may be observed.	Student has a clear grasp of information. Citations are introduced and attributed appropriately and accurately. Supporting material is original, logical and relevant. Student demonstrates full knowledge (more than required) by answering all class questions with explanations and elaboration. Speaking outline or note cards are used for reference only.	
3. Audience Adaptation (20 points)	The presenter is not able to keep the audience engaged. The verbal or nonverbal feedback from the audience may suggest a lack of interest or confusion. Topic selection does not relate to audience needs and interests.	The presenter is able to keep the audience engaged most of the time. When feedback indicates a need for idea clarification, the speaker makes an attempt to clarify or restate ideas. Generally, the speaker demonstrates audience awareness through nonverbal and verbal behaviors. Topic selection and examples are somewhat appropriate for the audience, occasion, or setting. Some effort to make the material relevant to audience needs and interests.	The presenter is able to effectively keep the audience engaged. Material is modified or clarified as needed given audience verbal and nonverbal feedback. Nonverbal behaviors are used to keep the audience engaged. Delivery style is modified as needed. Topic selection and examples are interesting and relevant for the audience and occasion.	
4. Language Use (Verbal Effectiveness) (20 points)	Language choices may be limited, peppered with slang or jargon, too complex, or too dull. Language is questionable or inappropriate for a particular audience, occasion, or setting. Some biased or unclear language may be used.	Language used is mostly respectful or inoffensive. Language is appropriate, but word choices are not particularly vivid or precise.	Language is familiar to the audience, appropriate for the setting, and free of bias; the presenter may "code-switch" (use a different language form) when appropriate. Language choices are vivid and precise.	
5. Delivery (Nonverbal Effectiveness) (20 points)	The delivery detracts from the message; eye contact may be very limited; the presenter may tend to look at the floor, mumble, speak inaudibly, fidget, or read most of the speech; gestures and movements may be jerky or excessive. The delivery may appear inconsistent with the message. Nonfluencies ("ums") are used excessively. Articulation and pronunciation tend to be sloppy. Poise of composure is lost during any distractions. Audience members have difficulty hearing the presentation.	The delivery generally seems effective – however, effective use of volume, eye contact, vocal control, etc. may not be consistent; some hesitancy may be observed. Vocal tone, facial expressions, clothing and other nonverbal expressions do not detract significantly from the message. The delivery style, tone of voice, and clothing choices do not seem out-of-place or disrespectful to the audience or occasion. Some use of nonfluencies are observed. Generally, articulation and pronunciation are clear. Most audience members can hear the presentation.	The delivery is extemporaneous -- natural, confident, and enhances the message – posture, eye contact, smooth gestures, facial expressions, volume, pace, etc. indicate confidence, a commitment to the topic, and a willingness to communicate. The vocal tone, delivery style, and clothing are consistent with the message. Delivery style and clothing choices suggest an awareness of expectations and norms. Limited use of nonfluencies is observed. Articulation and pronunciation are clear. All audience members can hear the presentation.	