SJSU Annual Program Assessment Form
Academic Year 2014-2015

Department: Physics & Astronomy
Program: BA/BS in Physics
College: Science
Website: http://physics.sjsu.edu/
X Check here if your website addresses the University Learning Goals.
Program Accreditation (if any): None
Contact Person and Email: Michael Kaufman; physics-chair@sjsu.edu
Date of Report: 5/22/15

Part A

1. List of Program Learning Outcomes (PLOs)
   Additional PLOs:
   1.9 Students can formulate numerical models to simulate physical systems.
   4.4 Students are proficient in scientific programming and computational methods.

2. Map of PLOs to University Learning Goals (ULGs)
   PLO 1.9 -> ULG 2.1
   PLO 4.4 -> ULG 4.1

3. Alignment – Matrix of PLOs to Courses
   Introduction of Phys 40, which combined with Phys 140 supports the two new PLOs

4. Planning – Assessment Schedule
   On-going. No updates or changes.

5. Student Experience
   No updates or changes.

Part B

6. Graduation Rates for Total, Non URM and URM students (per program and degree)

<table>
<thead>
<tr>
<th></th>
<th>First-Time Frosh</th>
<th>UG Transfer</th>
<th>New Credential</th>
<th>1st-Time Grad.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0%</td>
<td>33%</td>
<td>0%</td>
<td>11%</td>
</tr>
<tr>
<td>URM</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Non-URM</td>
<td>0%</td>
<td>25%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

7. Headcounts of program majors and new students (per program and degree)

<table>
<thead>
<tr>
<th></th>
<th>New FT Admit</th>
<th>New Transfer</th>
<th>Continuing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>22</td>
<td>7</td>
<td>57</td>
<td>86</td>
</tr>
<tr>
<td>BS</td>
<td>14</td>
<td>7</td>
<td>36</td>
<td>57</td>
</tr>
<tr>
<td>BA</td>
<td>2</td>
<td>0</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>MS</td>
<td>6</td>
<td>0</td>
<td>14</td>
<td>20</td>
</tr>
</tbody>
</table>

8. SFR and average section size (per program)
9. **Percentage of tenured/tenure-track instructional faculty (per department)**

   The percentage of T/TT faculty is 35%, which is well below the College and University averages (54% and 43%, respectively).

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### Part C

10. **Closing the Loop/Recommended Actions**

   Two major changes have occurred in the past year:

   a. In the Physics 2A series (algebra-based physics) one of the instructors has incorporated research-based interactive exercises into both the classroom and the lab, creating a more student-centered environment. The course has moved from one in which the students have 3 hours of passive lecture and 3 hours of rote laboratory exercise to one in which the students are active participants in their own learning. This was originally introduced for only her section of the course but in the past year we've expanded this active-learning model to half of the sections and it has now been adopted by multiple instructors. In Fall 2015 all sections of Physics 2A will be using this model and, after room remodeling is completed, the lab will be taught in a new space specifically designed for this type of “studio physics” instruction.

   b. The curriculum for the BA and BS programs has been revised to better meet the needs of our graduates who do not intend to pursue a Ph.D. in physics. Specifically, we have introduced a second computational physics course to align with our new Program Learning Objectives (see Part A). The second semesters of classical mechanics and physical chemistry are no longer required courses, allowing our students more flexibility in the design of their degree program.

11. **Assessment Data**

   As mentioned in last year’s report, students in lower-division physics courses were given the nationally-tested *Force Concept Inventory* (FCI). The FCI is a multiple-choice test of conceptual understanding in mechanics (PLO 1.1 and 1.4). The test is administered to the students on the first day of class and at the end of the semester. The initial test gives us a baseline to understand our students’ knowledge, while the test at the end of the semester allows us to measure gain in understanding. We have now collected data for multiple semesters, various courses, and for different instructors.

12. **Analysis**

   Initial results from the analysis of the FCI data was described in last year’s report. An updated analysis is will be performed this summer by Prof. Paul and her students; this analysis will be presented later this year at the American Association of Physics Teachers conference in College Park MA; the findings will be included in next year’s report.
13. **Proposed changes and goals (if any)**

The proposed changes are mainly the implementation and continuation of the projects described above, as guided by our on-going assessment of our undergraduate courses, both for majors and non-majors.