Department of Physics Annual Report: 2009 – 2010

Self Study

The department of physics has worked to continue to find new ways to better serve our students, even during these tough economic times. Some new projects were implemented this year, while others were postponed due to budget constraints. The department continued to see strong growth in our courses, continuing a trend of the past few years. This growth has led to a greater reliance on part-time lectures. As of fall 2008, 39% of our FTEF were lectures, and this proportion has only grown in the past year. The department is in need of another tenure track position to handle the growth of the past several years.

Curriculum

This year the department's new option in physics education was approved by the academic senate. This option is designed for students interested in teaching high school physics. The option was developed in tandem with other department in the college as part of the University's comprehensive effort to recruit and train more students to become secondary school science teachers. The department chair also attended a regional conference organized by the American Physical Society with the aim to develop inter-campus efforts to recruit physics majors into teaching careers.

The department offered one of two new upper division general education courses that were approved last year. The class had a fair enrollment in the fall, but the enrollment was too small in the winter and it had to be cancelled. Another existing upper division general education course offered on the Concord campus also had to be cancelled for the spring quarter due to low enrollment. On the other hand, our upper division GE class, PHYS 3700, has had enrollments of close to 100 all year, and our new online Biophysics class has also filled beyond the cap this spring.

A project that we were not able to institute this year was the expansion of our lower division physics sequence to four quarters. Nearly all colleges and universities offer at least a year and a half for this sequence, so we created a new course last year to give us more time to teach the introductory physics sequence. Unfortunately, the severe budget crisis has not allowed us to offer this course and will most likely force us to postpone it yet again next year. The mathematics department has been able to add a fourth quarter of calculus, and we will need to examine how we can include this course in our degree requirements next year.

Faculty

It was a very good year for our faculty and their professional activities. Dr. Singley is in the second year of his $285k Community College Transfer Project grant, and was also awarded $125k as part of the Math and Science Teacher Initiative this year. Dr. Kimball had his $250k NSF Spin Gravity research grant renewed for three more years. Dr. Helgren, Dr. Kimball, and Dr. Singley along with Dr. Maisello from chemistry were awarded a $393k NSF MRI grant to purchase and set up a dual use frequency comb - THz spectrometer based on an ultrafast femtosecond laser. Dr. Helgren, in his second year on campus has made outstanding progress at setting up his research lab and was

recently profiled in the quarterly campus magazine. All of these activities provide extraordinary opportunities for our students to receive the training they need to be successful in their careers.

Assessment Plan

The department of physics continues to implement its assessment plan. This plan is based on the three learning outcomes shown below. A summary of the data collected for each of these outcomes is given below.

1) Students will have a general understanding of the fundamental principles of physics.

For the past couple of years we have been measuring this outcome in our introductory physics sequence (PHYS 1001,2,3) for physics, engineering and chemistry majors. This is accomplished with pre- and post-tests. Students are given a qualitative exam on the first day of class of each quarter covering several core ideas. The same exam is given to the students on the last day of the quarter. This year we have expanded this pre- and post test to our introductory physics sequence for life science majors. We continue to see strong improvement in the students understanding after they have taken these courses.

2) Students should be able to effectively perform a physics experiment, analyze the acquired data, draw meaningful conclusions, and communicate these results to their peers.

We continue to measure this learning outcome in our upper division physics laboratories: PHYS 3281 Experimental Physics and PHYS 3283 Advanced Laboratory. The department has a standardized rubric for which we evaluate student's abilities to communicate scientific ideas.

3) Students have in-depth knowledge of the foundational subjects in physics (primarily analytical mechanics, quantum mechanics, thermodynamics and statistical mechanics, and electrodynamics).

Students enrolled in our capstone class, PHYS 4950 were given a physics GRE exam at the end of the quarter.

2006	average score	710
2007	average score	524
2008	average score	
2009	average score	605

Institutional Data

Physics					
	Fall Quarter				
	2004	2005	2006	2007	2008
A. Students					
1. Undergraduate	18	20	22	19	26
2. Graduate	3	1	0	0	0
3. Total Number of Majors	21	21	22	19	26
4. FTES Generated	96	91.2	112.4	139.6	134.2
	College Years				
B. Degrees Awarded	03-04	04-05	05-06	06-07	07-08
1. Undergraduate	5	5	1	6	0
2. Graduate	0	0	0	0	0
3. Total	5	5	1	6	0
	Fall Quarter				
	2004	2005	2006	2007	2008
C. Faculty					
Tenured/Track Headcount					
1. Full-Time	3	4	3	3	4
2. Part-Time	0	0	1	1	0
3. Total Tenure Track	3	4	4	4	4
Lecturer Headcount					
4. Full-Time	0	0	0	0	0
5. Part-Time	3	2	3	4	4
6. Total Non-Tenure Track	3	2	3	4	4
7. Grand Total All Faculty	6	6	7	8	8
Instructional FTE Faculty					
8. Tenured/Track	2.6	4.1	3.5	3.6	3.7
9.Lecturer	1.6	1.4	1.7	2.4	2.4
10. Total Instructional FTEF	4.3	5.4	5.2	6.0	6.1
Lecturer Teaching					
11. % Lecturer/Total Instructional FTEF	38.4%	25.2%	32.4%	39.9%	39.1%
12. FTES Taught by Lecturer	49.1	27.6	48.1	90.1	76.7
13. % FTES Lecture/FTES Generated	51.2%	30.3%	42.8%	64.6%	57.2%
D. Student Faculty Ratios					
1. Tenured/Track	17.9	15.6	18.4	13.7	15.5
2. Lecturer	30.1	20.1	28.7	37.6	32.2
3. SFR By Level (All Faculty)	22.6	16.8	21.7	23.2	22.1
4. Lower Division	26.1	20.0	25.4	25.5	24.1
5. Upper Division	11.6	8.8	12.3	16.6	15.4
6. Graduate	.	.	.	.	.
7. Number of Sections Offered	23	27	26	31	26
8. Average Section Size	27	23	25	24	26

Source and definitions available at: http://www.csueastbay.edu/ira/apr/summary/definitions.pdf