

# **Program Review Committee Report**

## **Department of Physics & Astronomy**

### **Spring 2009**

#### **Mission**

The Department's mission statement is well-defined and consistent with the mission of the University. It clearly identifies the Department's constituents, and explicitly indicates a commitment to life-long learning.

#### **Unit Description**

The Department offers both B.A. and B.S. degrees for majors, in addition to providing service courses for other departments and for general education. Community outreach activities include hosting both public open house events and special events in the Crane Observatory and the planetarium.

#### **Success in Meeting Previous Goals and Objectives**

For the 2003 to 2008 period, the Department identified six goals, with a total of eight associated objectives. For the most part, all of these goals and objectives were met during the review period, with the exception of the comprehensive foundation for continued application/study by graduates, and some minor unmet objectives in a handful of courses.

#### **Success in Responding to Concerns in Previous Program Review**

The previous review report expressed four concerns, all of which appear to have been successfully addressed as follows:

1. *Assessment.* Metric of number of students receiving a C grade or better was changed to 70% of students receiving a 70% or better. The physics Major Field Test (MFT) has been added as an assessment tool for majors, and future methods will track success of graduates.
2. *Faculty.* A lecturer position was converted to a tenure-track position, and a new lecturer position was established to teach geology and meteorology. The Department is also seeking to hire a lecturer who would also serve as the planetarium/observatory coordinator, adding 0.5 faculty FTE.
3. *Planetarium equipment.* The planetarium projector was replaced.
4. *Program space.* The Department's space needs were addressed by the Stoffer Science Hall addition/renovation.

#### **Historical Data**

In terms of student credit hours, the Department's activity has generally followed the overall University enrollment trends. The pre-engineering program's credit hours have generally risen over the review period, except for 2007-2008, when a particular class was not offered. The number of graduates in the department has remained at five per year or less, indicating a significant portion of credit hours are provided in a service role. The new B.S. in computational

physics is expected to increase both the number of majors and the number of upper-level credit hours.

The Department currently consists of 5 full-time faculty, up from 4, and 1.3 adjunct faculty FTE, down from 1.5 FTE. This is an overall increase of 0.8 faculty FTE during the review period. All full-time faculty members possess terminal degrees. The department's budget increased by 42% over the review period.

### **Learning/Effective Teaching**

Appropriate assessment processes and outcome measurements are in place. The outcome measurement relative to pre-engineering students' success in achieving the objectives of the Department's comprehensive foundation goal needs to be "tweaked" to better measure results for all transferees, not just those who ultimately receive an engineering degree.

Department faculty continually improve teaching materials and methods. This includes limiting class size to allow more personalized instruction, and the use of technology to enhance instruction.

### **Acquisition, Discovery and Application of Knowledge**

As noted above, all full-time faculty members possess terminal degrees. Faculty members are active in research, both their own and students', and encourage lifelong learning through community outreach activities. Such research often involves collaboration with other scientific disciplines.

### **Engagement and Service**

Department faculty members engage their constituencies in a number of ways. This is demonstrated by the level of community outreach, interaction with students, collaboration with other departments, and service to the University via committee memberships and other activities.

### **Unit Strengths, Weaknesses and Status**

The Department reported 11 strengths, which can broadly be summarized as: (1) program space, technology and equipment; (2) comprehensive course offerings by qualified faculty in small classes; (3) community outreach; and (4) scholarships and engineering transfer program.

Weaknesses identified by the Department consist of: (1) HiPACE difficulties; (2) vacant geology lecturer position; (3) insufficient full-time faculty; (4) light and noise pollution on observatory deck; (5) student recruiting outcomes; and (6) half-time secretarial support.

Based on the data provided, the Department appears to be comparable with other institutions of similar size in terms of bachelor's degrees conferred.

### **Students**

Reported instances of student success are somewhat spotty. Although one recent graduate was noted as a Sibberson Award recipient, exit exam pass rates are below the Department's target.

Recruitment efforts are mostly passive in nature, and have resulted in outcomes the Department cites as a weakness. The engineering transfer program's recruitment efforts are more active and directed.

Scholarships are used as both a recruiting tool and a retention tool. The Department chair is the primary advisor for physics majors; the coordinator of the engineering transfer program advises students in that program.

### **Summary of Unit**

The Department of Physics and Astronomy serves the University through major, service and general education courses, and serves the community through various outreach activities. Its faculty members possess appropriate credentials, and are active in teaching, research and service.

### **Future Program Goals, Objectives and Assessment Methods**

The Department's stated future goals, objectives and assessment methods are essentially the same as for the preceding five years.

### **Proposals for Change**

Six proposals for change were offered by the Department:

- Improve access to/from HiPACE computers
- Fill open geology/meteorology lecturer position quickly
- Move observatory to a location with less light and sound pollution
- Improve recruiting via increased use of teleconferencing
- Hire additional lecturer to cover introductory general education physics courses
- Increase Department secretary from half-time to full-time

These proposals address the six departmental weaknesses reported by the Department.

### **Program Rating:**

Operating at an acceptable level.

### **Recommended Action:**

- Clarify assessment metrics for students in engineering transfer program.
- Determine if MFT assessment metric is appropriate in light of difficulty motivating students to perform well on the test.