

Department of Physics Program Review

Dean's Response

June 25, 2008

The mission of the College of Science states:

The College of Science provides quality education in the natural sciences and mathematics. The college offers majors and minors in seven departments (Botany, Chemistry, Geosciences, Mathematics, Microbiology, Physics, and Zoology). The college also supports students through its Developmental Mathematics Program. The departments and programs of the College of Science support professional and graduate school preparatory programs, and contribute significantly to the general education of students by improving scientific understanding of the natural world and quantitative literacy. Education is provided through formal classes, laboratory and field experiences, and undergraduate research projects. Student learning is also supported by departmental clubs and professional preparatory organizations. The college promotes science and mathematics teaching through the Center for Science and Mathematics Education, and community outreach through such facilities as the Layton P. Ott Planetarium and Museum of Natural Science.

The programs in the Department of Physics are designed to contribute to the overall mission of the College of Science by providing general education courses, support courses for other programs, and major programs that prepare students for employment or further education.

The program review team noted a number of strengths in the current program: (1) "...the excellent faculty that are dedicated to providing the best physics education possible for undergraduates"; (2) the Department's curriculum; (3) the Department's emphasis on undergraduate research; (4) the Department's focus on community outreach; and (5) a comprehensive program of assessment of faculty performance.

The Dean agrees with the determination of the program review team regarding the strengths of the Department of Physics. The Dean also agrees with the additional comment made in the Department's response that they feel that service to the profession of physics teaching is also a significant strength of the Department. The faculty in the Department of Physics are clearly its greatest strength, given their enthusiasm, commitment to teaching in the classroom and the laboratory, their involvement of undergraduates in active research programs, and their efforts to bring the excitement of science to the community and the state of Utah through active and engaging outreach programs, and to the nation (and even internationally) through developing K – 12 planetarium modules for science core curricula, and through textbook writing.

Along with its strengths, the review team identified a number of challenges for the programs in the Department of Physics: (1) “For faculty members who are involved in research, the 12 teaching credit hours per semester is, in effect, an overload that cannot be sustained without burnout or loss of faculty to other institutions”; (2) “Significant problems ... exist with respect to the administration of external grants at Weber State University ...”; (3) “Continuing the present curriculum and providing for significant increases in student numbers will require increased faculty and laboratory space, both for research faculty and for laboratory-based course work”; and (4) the department’s computational facility “requires technical support beyond what can be supplied by regular faculty members in order to remain a useful resource”.

Again, the Dean believes that the review team has done a good job of identifying significant challenges that need to be addressed as the Physics Department continues to move forward and strengthen its program over the next five years. In addition to the four challenges identified above, it would also be appropriate for the Department to focus on the negative enrollment trends in general education courses that have plagued it in recent years even though the numbers of students in service courses have increased somewhat and majors graduating from the program have remained relatively flat and stable.

Regarding the review team’s concern over faculty workload as it applies to research, the College of Science Chairs’ Council has already begun such a discussion, particularly as it applies to undergraduate research, and plans to revisit the issue in a more focused way during Fall Semester, 2008. The issue is becoming increasingly important to the entire college given (a) the rapid growth in undergraduate research, (b) the very conservative policy of providing 0.25 TCH per SCH, which is far too restrictive for the time-intensive mentoring required of undergraduate research, and (c) the importance of supporting active research programs for faculty interested in remaining current in their disciplines, which is a fundamental requirement of excellent teaching, especially in rapidly developing disciplines. The Dean anticipates that a formal policy regarding reassigned time for research and scholarship activities will emerge from this fall’s discussion.

Over the past several years there has been a significant increase in the amount of writing for external grants that has been occurring within the Department of Physics and in other departments in the College of Science. While major grant writing is strongly encouraged within the College, such activity does require a significant commitment on the part of the departmental faculty, combined with appropriate support from the College and the University. With a growing focus on obtaining external funding, the University has just completed a search for a new director of the Office of the Sponsored Projects. It is anticipated that the hiring of the new director will enhance the support provided to grant writers in the College of Science and across the campus. The College of Science Chairs Council has also discussed the possibility of hiring an individual into a new position as an Associate Dean or an Assistant to the Dean that will support Principle Investigators with grant writing and post-award support. However, this decision is pending, based on the future direction and support of the Office of Sponsored Projects.

The review team also commented on the need to establish a formal policy regarding the capture of indirect (formally F&A, or facilities and administration) costs that provide support at the departmental and PI level. At the present time, the F&A capture that comes to the College of Science has been used collectively to support equipment purchases and remodeling needs. However, an “experiment” is underway with one faculty member in the Physics Department such that 15% of the F&A that the member’s grant writing generates is redistributed back to the department and 10% to the PI, with 25% remaining at the Dean’s level and 50% being held centrally. Given the very low negotiated F&A rate that currently exists at Weber State University of 34.8% of salaries and benefits only, the amount filtering down to the department and the PI is likely to be very small.

It is critical that Weber State University move toward a higher negotiated F&A rate that also includes equipment costs. Not only will this result in additional needed revenue generated by grants that can then more fully support the administrative costs associated with the activity, but it will also help to support facilities remodeling and ongoing maintenance that are required for expensive and delicate scientific instrumentation. However, given the significant concerns expressed by some faculty regarding the redistribution of F&A costs, the College of Science Chairs’ Council is planning on developing a policy based on the current negotiated rate that will represent the consensus of the College on the issue. A draft of this policy should be ready for discussion in Fall 2008.

As the review team also pointed out, severe space limitations are also developing in the Department of Physics. This is also true throughout the College of Science, and is negatively impacting all departments. The Science Laboratory building is now nearly 40 years old (completed in 1969) and the adjacent Lind Lecture Hall is only one year younger. The design and current status of the Science Lab building is highly restrictive to collaborative projects and suffers from significant fire, earthquake, and asbestos issues. However, more immediately, there is no available space in the building for expansion of programs, or for necessary support of research by faculty and students. Efforts are continually underway to identify temporary and long-term solutions to the challenging space constraints that the College of Science currently operates under.

Concerning the review team’s recommendation regarding support for the Physics Department’s computational facilities, the Chairs’ Council has already determined that it is important to support a College of Science information technology specialist. Although this individual will have significant responsibility for support of the geographic information systems laboratory in Geosciences and the 132-node supercomputing cluster and associated computational classroom in Physics, the individual will also be available to support IT needs across all of the departments in the College of Science. A committee has been organized to conduct the search that reflects the interdisciplinary requirements of the position, with the expectation that a person will be hired during Fall Semester, 2008.

Finally, in order to help encourage increases in the numbers of majors in all programs as well as address the declining SCH issue, the College of Science has a very active publicity and recruitment committee with representation from every department in the College. The College's general advisor also supports the publicity and recruitment activities of the committee. The committee has recently revised recruitment materials that are provided to the recruitment office and assisted in updating our departmental and college web pages. In addition, a monthly College of Science E-Newsletter is published out of the Dean's office which features one department or program in each issue, along with special announcements.

The College of Science Chairs' Council also began a conversation this past spring about developing new and inviting general education offerings that meet the recently revised and adopted Life Science and Physical Science general education goals and criteria. This conversation will continue into this fall and will integrate with the campus-wide conversation regarding general education assessment. It is of paramount importance that graduates of Weber State University develop a significantly deeper understanding of and appreciation for science and mathematics, and that the number of students majoring in the sciences and mathematics increase. Of course this is not simply a Weber State University issue, but it reflects national trends. As documented in countless state and national reports, the low level of understanding and expertise in STEM fields (Science, Technology, Engineering, and Mathematics) is at a crisis level for the United States in terms of maintaining a competitive advantage in the world economically, technologically, and scientifically.

The Dean greatly appreciates the thoughtful self-study developed by the Department of Physics, the numerous informed comments made by the program review team, and the reflective response by the Department. Many of the concerns and recommendations suggested by the review team are already being addressed, but the recommendations will also certainly be very helpful in strategically planning for the next five years of the program.