

Institutional Effectiveness Report

Assessment Summary

Department or Division: Physics, Astronomy, and Geosciences

Degree Program: Bachelor of Science in Physics

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Assessment Cycle (academic or calendar year): 2008-2009

Mission (related to VSU mission):

The program leading to the B.S. degree with a major in physics is designed to provide students with knowledge in the fundamental branches of physics (mechanics, electromagnetism, and quantum mechanics) as well as several elective areas within the field of physics, such as thermodynamics, electronics, optics, and computational physics, and to prepare students to enter graduate programs or related disciplines, or to embark upon careers in research laboratories, government, industry, or education.

Assessment History (discuss here how and when the program developed its current assessment program, what it used prior to starting that program to assess its effectiveness, etc.):

Prior to 1998, the physics major program was assessed via the Student Exit Questionnaire (required of all graduates) and by requiring all graduating seniors to take the Graduate Record Examination in Physics. With the adoption of a semester calendar in 1998 the Department of Physics, Astronomy, and Geosciences had an opportunity to redesign the curricula of all its degree programs. The following measures to improve assessment have been taken during the past decade:

- 1) Once students have declared physics as their major course of study, they begin maintaining a portfolio containing representative samples of their coursework, research projects, and other activities related to the major. These are retained by the Department when the student graduates.
- 2) Area Committees in various departmental disciplines have been established, consisting of faculty teaching in those disciplines. The Physics and Astronomy Area Committee periodically evaluates the effectiveness of the physics major program, and suggestions modifications as deemed necessary. This Committee evaluates the student portfolios described above.
- 3) A Capstone Course was added to the curriculum. Originally this was a two-semester series totaling three credit hours, due to a Board of Regents requirement that the physics program total 120 credit hours. Designed to be taken by all physics majors during their senior year; it was later modified to a single two-credit course. Because of staff limitations, on occasion students have taken this course during their junior year. Students in this course deliver oral and written reports on various research topics, take practice physics GRE exams, and complete their student portfolios. Students are encouraged to develop these projects for presentation at the annual Undergraduate Research Symposium sponsored by the Council on Undergraduate Research.

- 4) A Departmental Alumni Committee has been formed, consisting of the Department Head, Area Committee Chairs, and an alumnus from each of the departmental disciplines. This meets in October of year during Homecoming. This meeting provides an excellent forum for discussing the “health” of the physics program, and for seeking guidance from former majors as to how the program might be improved.
- 5) A departmental newsletter, published annually, was initiated to help maintain contact with former graduates. This facilitates feedback from past students as to how well the physics program has prepared them for graduate school or for their career goals. The Department also maintains an alumni contact list.
- 6) A Departmental Reunion was held in October 2003, in conjunction with VSU’s Homecoming Celebration. This was very successful, with a large turnout. Based upon that success we decided to hold similar reunions at three-year intervals; unfortunately the one in 2006 was attended by only a handful of alumni. We are evaluating the desirability of having such reunions on a less frequent basis (e.g., every five years).
- 7) During the 2003-2004 academic year an internal program review was conducted by departmental faculty (notably Dr. Flaherty). Their report was submitted to the Georgia Board of Regents.
- 8) Data on physics degrees awarded and on enrollment in introductory physics classes are submitted to the American Institute of Physics each year.

The Area Committee is considering several additional assessment measures, including (but not limited to):

- 1) Creation of a comprehensive physics examination, to be required of all majors prior to graduation. This would replace the Physics GRE requirement which had been lifted (primarily because of cost considerations) years ago.
- 2) An external program review, to be conducted by the Physics and Astronomy Division of the Council on Undergraduate Research or some similar body.

Expected Student Learning Outcomes:

As described in the *2008-2009 Valdosta State University Undergraduate Catalog*, students majoring in physics:

- 1) will demonstrate knowledge in the fundamental branches of physics: mechanics, electromagnetism, and quantum mechanics.
- 2) will demonstrate knowledge in several elective areas within the field of physics, including (but not limited to) thermodynamics, electronics, optics, and computational physics.
- 3) will apply the techniques of mathematical analysis (algebra, geometry, trigonometry, and calculus) to physics problems.
- 4) will effectively use computers and calculators for scientific calculation, programming, and word processing.

Assessments (include when and to whom these are administered, and align goals with specific assessments):

All four learning outcomes described above are assessed through testing in required physics courses at all stages of the curriculum. Physics majors enroll in PHYS 4501, the Capstone Seminar course, during the spring semester of their senior year.

2005-2006

- Assessment Results (submit an electronic file of the data collected): Three students enrolled in PHYS 4501 (Capstone Seminar I) fall semester and two in PHYS 4502 during spring. The student who did not continue changed major to Communication Arts.
- Discussion/Dissemination of Results: Several faculty in the Area Committee felt that the second one-hour course added little to our students' Capstone experience, and recommended its removal.
- Modifications Made: The second, one-hour Capstone Seminar course was deleted from the curriculum.

2006-2007

- Assessment Results (submit an electronic file of the data collected): No students enrolled in PHYS 4501 during this academic year.
- Discussion/Dissemination of Results: The physics majors who graduated in Spring 2007 had taken PHYS 4501 during the previous year. Two of them received the award for best undergraduate physics paper at the 2007 meeting of the Georgia Academy of Sciences; this may be viewed as evidence of the soundness of our program.
- Modifications Made: None.

2007-2008

- Assessment Results (submit an electronic file of the data collected): One physics major enrolled in PHYS 4501; received degree in May 2008.
- Discussion/Dissemination of Results: Based upon comments made by some former students, and by the graduate advisor of one, the Area Committee determined that astronomy majors would benefit from a more extensive background in mathematics.
- Modifications Made: The curriculum was modified to allow astronomy majors to take elective classes in mathematics.

Dept. Head/ Director	Date	Dean	Date	VPAA	Date
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Adapted from: University of Alabama SACS site (<http://sacs.ua.edu/degreeInfo2.cfm?college=2&dept=50>);

University of Western Kentucky SACS Accreditation Review Process (<http://www.wku.edu/sacs/assessmentmanual.htm>) ; and

Mrs. Marila D. Palmer, VP-Executive Affairs & Planning, LeTourneau University, Presentation to 2008 SACS-COC Institute