

**The University of North Carolina  
Program Review and Recommendations Form**

**Date:** November 10, 2008

**Constituent University:** University of North Carolina Wilmington

**CIP Discipline Number:** 40.0801

**Exact Title of the Program:** Physics

**Exact Degree Abbreviation:** B.S. and B.A.

- 1. The accompanying guidelines list questions about centrality to mission, quality, faculty and physical resources, demand, costs, duplication, and consequences of deletion. After considering those issues, which of the following does the campus recommend?**

Retain the program in its present configuration with specific steps to be taken to increase enrollments.

- 2. As more programs, certificates, licensure programs, and courses become available online through the University of North Carolina Online would you be willing to consider online courses or programs from another campus to meet the needs in this program?**

No      Would you be interested in exploring a joint online offering with one or more other campuses to meet the needs this program is currently addressing?

No      Would you be interested in utilizing an online degree program or courses from another campus to meet the needs this program is currently addressing?

- 3. Explain the above responses—either the rationale for leaving the program in its current configuration or specific steps proposed to increase enrollments or pursue other options.**

With the increasing reliance on technology in our everyday lives, a workforce adequately trained to meet society's needs must be firmly grounded in the sciences. Physics clearly plays a fundamental and indispensable role in the life of the university and its ability to fulfill its broader educational mission. Programs of study leading to the baccalaureate degree in physics offer avenues for employment or advanced study to graduates and attract and retain highly qualified faculty. The UNCW physics program also supports the university's emphasis on environmental and marine science through its curricular offerings in physical oceanography and environmental physics.

UNCW first began offering the B.S. and B.A. degrees in physics in 1972. UNCW's Department of Physics and Physical Oceanography has nine full-time faculty members, all of whom hold the Ph.D. in either physics or physical oceanography. The University's proximity to the coast provides a unique opportunity for interdisciplinary programs of study in oceanography and environmental science that are firmly grounded in the principles of physics. Three of the departmental faculty have expertise in these areas. In the coming year, the department will introduce a degree concentration in physical oceanography for those students wishing to pursue a career in that field.

All physics faculty engage in scholarly pursuits, a circumstance that affords unique opportunities for undergraduate student involvement in scientific research. In recent years physics majors have participated in oceanographic studies aboard ocean-going research vessels, and engaged in nuclear physics research at the Triangle Universities Nuclear Laboratory (TUNL), the National Institute of Standards and Technology (NIST), and the Thomas Jefferson National Laboratory (JLAB).

The department routinely engages in a regular program of instructional evaluation, assessing each course in every semester that it is taught. Other efforts to ensure instructional quality include annual peer review of all examinations administered throughout the year in each physics course, and the senior "capstone" course requirement, wherein each student carries out an independent investigation under faculty supervision and presents the results in a public forum. Graduate school admissions are an indirect measure of an undergraduate program's quality, and the record shows that UNCW physics graduates frequently gain acceptance to the nation's premier graduate programs. Recent graduates now pursue advanced study at the University of Colorado at Boulder, the MIT-Woods Hole Joint Program in Oceanography, and the North Carolina State University.

While the number of physics majors has never approached those for the other sciences at UNCW, the program has generally fared much better than most physics programs offered by comparable universities within and outside the UNC system. The following table reflects the productivity of UNCW's physics program over the last five years:

Year	No. of Majors (all levels)	BA Degrees Awarded	BS Degrees Awarded
2003-2004	23	3	4
2004-2005	22	0	4
2005-2006	17	1	6
2006-2007	22	1	5
2007-2008	29	3	3

Statewide comparisons are especially revealing. For Fall 2007 (the latest for which statistics are available from the American Institute of Physics), UNC Wilmington (with 25 majors at the JR/SR level) ranked 7<sup>th</sup> in the state behind NC State (92 majors), UNC Chapel Hill (64 majors), Appalachian State (52 majors), UNC Charlotte (38 majors), Duke University (36 majors), and Wake Forest (29 majors). When faculty numbers are taken into account, UNCW ranked 2<sup>nd</sup> in the state (behind only Appalachian State) in the number of majors per full-time teaching faculty.

Increasing the number of majors constitutes the biggest challenge we face. The department is pursuing several initiatives to promote and/or expand its degree programs and make the physics degree more attractive to prospective majors. These include:

1. An Honors section of the introductory physics laboratory, wherein especially talented and enthusiastic students exercise their creativity by designing and carrying out innovative investigations.
2. New and exciting research opportunities for undergraduates, both on and off site, through collaborations with research-active faculty.
3. An active colloquium series featuring regular twice monthly talks by visiting scientists.
4. New degree concentrations (especially in oceanography and environmental physics), which build on existing university strengths, student interests, and resident physics faculty expertise. A physical oceanography concentration is slated for implementation in Fall '09.
5. A 3+2 combined program in Physics/ECE, with the successful student receiving a B.S. degree in Physics from UNCW and a B.S. degree in Electrical Engineering from NCSU, all within five years. This program was instituted in Fall '07.
6. Active recruitment of other science majors, with the goal of adding physics as a second major. The B.A. degree option is especially suited to this strategy, as many science majors can complete Physics B.A. degree requirements with little added coursework.

The department also serves the university by providing “foundation” courses for science and mathematics majors and by offering general-interest courses that satisfy Basic Studies requirements. The continuing demand for introductory physics instruction underscores the important role the department plays in providing such service courses to majors in numerous other fields.

Elimination of physics degree programs would adversely impact the university. Without a physics degree program, it would be impossible to attract quality physics faculty members who not only support the physics majors, but also interact with faculty from other disciplines in research efforts.

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