

PHYSICS

Mission and Structure

The Physics program, while maintaining the rigorous standards appropriate to the discipline, carries enough flexibility to accommodate students with diverse career objectives and academic goals. The general structure of the Physics curriculum is as follows:

1. A three-course introductory sequence with Mathematics corequisites. The first two courses have integrated basic laboratories.
2. Intermediate level courses where the students learn to use mathematical techniques to solve physical problems.
3. Advanced level courses concentrating on content and concepts.
4. Independent Study Project and Science Seminar which involves an one on one interaction between the student and a faculty member.

This type of structured approach is helpful in preparing the students to a wide variety of careers, graduate school, teacher certification and cooperative engineering programs. In addition, there are also courses available for the science student whose discipline (Chemistry, Biology, Environmental Science, Mathematics and Computer Science) requires an understanding of basic physics principles and for the general student who needs an illustration of the physics principles that affect our daily lives and an appreciation of the role played by Physics in achieving the progress we see in our world.

The following specific goals of the Physics program are in many ways related to the statement of purposes arising out of the mission of the college. We believe that recognizing and appreciating the role of Physics in our daily lives can prepare the students for rich personal and professional lives. The specific goals #2 to 5 of the Physics programs can foster and promote intellectual inquiry and critical analysis. They also help the students to recognize and understand that the natural and social sciences follow a standard method of inquiry commonly known as the scientific method. Goals # 2 and 6 emphasize the importance of in-depth study in the major and our department does provide the students with a learning environment which fosters the discovery of connection among disciplines and larger patterns of meaning (goal #6).

Assessment of Major Objectives

Goals of the Program	Most Relevant Courses	Assessment Measures
1. Recognize and appreciate the role of Physics in our daily life.	103, 130, 132 and 134	Tests, homework problems, papers and laboratory reports
2. Understand and appreciate the principles and laws of Physics the discovery of which has led to modern technology and progress.	All courses	Same as above
3. Learn to analyze, simplify and solve physical problems using mathematical techniques.	130, 132, 134, 208, 210, 211, 212, 302, 303, 312, 325, 356	Tests, homework problems, quizzes and laboratory reports
4. Understand the basic tenets of scientific method - interpretation of data, formulation of hypothesis, development of theory, verification and reformulation of theory (in necessary).	All courses	Tests, papers, laboratory reports, Independent Study Project and Science Seminar
5. Learn basic laboratory skills of instrumentation, data collection, analysis and scientific report of the results obtained.	103, 130, 132, 190, 210, 211, 212, 302, and 325	Class observation, laboratory reports and Independent Study Project
6. Understand the content and concepts of Physics at an advanced level and critically examine their implications and validity.	302, 303, 312, 325, 356 and 420	Tests, papers, laboratory reports and Independent Study Project

Assessment of Student Learning in the Major

The success of the program is assessed through the achievement of its goals as explained above. Further assessment is made by follow up measures such as alumni survey, performance in GRE tests, adequate preparation and success in graduate school and employment statistics of graduates.

The departmental majors receive close attention with regard to their progress and the problems they may face - both academic and personal. This is possible because of small class sizes (5 to 10 students in post-freshman major classes), the advising role of faculty members and the strong faculty-student relationship that exists as envisaged in the Mission of the College.

End-Point Measures

The department conducts an exit interview with all graduating seniors or juniors (3-2 program) using a standardized questionnaire and oral interview and records are maintained. The oral interview and the standard questionnaire are designed to assess how far the department is achieving its goals. If necessary, remedial measures would be taken through the budget process by discussing those measures in the department's annual report.

The following reports are collected in relevant cases and studied:

1. GRE scores
2. Graduate school performance - passing the qualifiers, need for remedial courses, etc.
3. Summer internship reports
4. First-year performance in engineering schools

These four indicators, to some extent, can assess the overall learning outcomes of the Physics program, especially in the case of students heading towards Graduate or Engineering schools.

The detailed project reports of the Senior Independent Study Projects are filed and evaluated on the basis of expected standards. The project reports are carefully examined to assess how far we are reaching the specific goals #4, 5, and 6. A brief analysis in this regard is attached to each report.