

DEPARTMENT OF PHYSICS

COLLEGE OF ARTS AND SCIENCES

Faculty

William Nettles (2006). Professor of Physics and Acting Chair. B.S., Mississippi College; M.S., and Ph.D., Vanderbilt University

David A. Ward (1992, 1999). Professor of Physics, B.S. and M.A., University of South Florida; Ph.D., North Carolina State University.

Curriculum

The programs in physics at Union University seek to effectively serve all students within the institution, recognizing that each student's needs may be different, with different career goals. The curriculum is designed to provide basic content for students classified as physics majors/minors, non-science majors, engineers, pre-professionals, and those preparing for a teaching career in secondary school. The physics faculty seek to help students understand the physical world (the universe) by examining the laws which govern all things, the methods by which the cosmos can be studied, and physics' relationships to other aspects of human experience. The faculty endeavor to create an atmosphere in which students are challenged to acquire problem-solving skills using advanced mathematics and modern methods in science. Students are encouraged to develop in-depth analytical skills and an inquiring attitude toward scientific inquiry while maintaining a Christian worldview. The physics curriculum provides the liberal arts students with a working knowledge of science and meets the needs of students who wish to:

- pursue a teaching career in elementary or secondary school;

II. Major in Engineering Physics—73 semester hours

A. Prerequisites: CHE 111, 113; CSC 115; CSC 245 or 255; ECF 211; MAT 211, 212, 213, 314; MAT 315 or 208

B. PHY 231, 232, 311, 313, 314, 325, 400—26 hours

D. EGR/PHY 262 and EGR/PHY 360—7 hours

III. Major in Physical Science—48 hours

A. CHE 111, 112, 113, 211, 221—15 hours

B. PHY 112, 231-32, 311, 310 or 301—22 hours

C. Upper Level Electives from CHE & PHY—7 hours; maximum 1 hour from 424 and 1 from 498

IV. Minor in Physics—24 semester hours

Physics 231-232, 311, + 10 hours of Physics electives except PHY 111, 112, 301, 310

V. Teacher Licensure in Physics (Grades 7-12)

A. Complete the requirements shown above for the Physics major.

B. Professional Education: EDU 150, 250, 326, 418, 433, PSY 213, 318, SE 225.

C. Complete the applicable portions of the Praxis II.

D. For additional information, see the Assistant Dean for Teacher Education and Accreditation.

Assessment of Major

All Physics majors are required to take a research class, PHY 424, and a seminar class, PHY 498, in which presentations are made and students are questioned orally. Seniors must also take the Major Field Examination in physics and if seeking teacher licensure, complete the required education tests such as PRAXIS.

Student Organizations

The **Society of Physics Students (SPS)** stimulates an awareness of physics and the related sciences, and acquaints students with professional opportunities within the discipline. The organization promotes professionalism and pride in the physical sciences and assists students in studying, preparing, and presenting technical material. Membership is open to any student interested in physics.

Student Awards

The **Physics Research Award** is given by the faculty of the Department of Physics to the student who presents the best research paper of the year. The research must have been an original work and must be presented at a state, regional, or national professional meeting prior to the graduation.

424-425. Physics Research (1-3) F, S

Prerequisite: PHY 311.

Application of a simple piece of original work to include a literature search and summary paper on a topic of current interest in physics. Under faculty supervision, this work may be done off site at a national laboratory or comparable research facility.

430. Experimental Physics Laboratory (3) F—Even Years

Prerequisites: PHY 311 & MAT 213.

Modern experimentation, research, data acquisition and analysis. The theory, practice and reporting of research in a scientific format are demonstrated through experiments in atomic, nuclear, solid state, thermodynamics, and optics. One lecture, 4 lab hours/week.

498. Seminar (1-3) S

Prerequisite: 20 hours of physics and junior/senior standing.

Skills in scientific and technical presentations, written and oral, will be polished. To be used at the discretion of the department for majors/minors only.

179-279-379-479. External Domestic Study Programs (1-3) As Needed

All courses and their applications must be defined and approved prior to registering.

180-280-380-480. Study Abroad Programs (1-4) As Needed

All courses and their application must be defined and approved prior to travel.

195-6-7. Special Studies (1-4) On Demand**295-6-7. Special Studies (1-4) On Demand**

Lower-level group studies which do not appear in the regular departmental offerings.

395-6-7. Special Studies (1-4) On Demand

Upper-level group studies which do not appear in the regular departmental offerings.

495-6-7. Independent Study (1-4) On Demand

Individual study under the guidance of a faculty member(s).

498-9. Seminar (1-3) As Needed

To be used at the discretion of the department.