

DEPARTMENT OF PHYSICS & ASTRONOMY

Chair: Dr. Derek W. Jokisch

Faculty: Ginger Bryngelson, Lorna Cintron-Gonzalez, Larry Engelhardt, Philip Fulmer, Derek Jokisch, Jordan McDonnell, Joe Mehaffey, Jeannette Myers, David Peterson, Sethfield Smith, Justin Yates

MISSION STATEMENT

The Department of Physics and Astronomy offers a baccalaureate degree in Physics with a concentration in Computational Physics or Health Physics. Courses are offered in Physics, Physical Science, and Astronomy that fulfill the University's General Education requirement. These courses also serve as foundation courses for majors in biology, chemistry, mathematics, and engineering. **The fundamental natural laws of the physical universe and the methods of scientific inquiry are essential parts of a liberal arts education.** B.S. degrees in Engineering Technology with concentrations in Civil or Electronic are offered in conjunction with South Carolina's technical colleges. The Environmental Science option in Physics offers students a B.S. degree in Physics with a concentration in Environmental Science.

The Physics programs seek to offer courses in astronomy, physical science, and physics that are taught by full-time faculty members with appropriate advanced degrees dedicated to science education at the University level. The courses offered in the department range in level from introductory courses that expose non-science majors to scientific thought to advanced courses that cover current and complex topics in modern physics. The laboratory experience is required in appropriate courses to illustrate the importance of experimentation to the scientific endeavor. **For the majors in physics, the opportunity to undertake undergraduate research is offered.** Since part of research is the interpretation and communication of results, majors graduating from these programs in the department are expected to be proficient in oral and written communication, familiar with the scientific literature, and aware of the importance and usage of computers in science.

Students completing the majors offered by the department will be **prepared for careers in industry and scientific research** or for graduate school.

ASTRONOMY

Coordinator: Dr. Jeannette M. Myers

MAJOR

No major in astronomy is offered.

MINOR

No minor in astronomy is offered.

COLLATERAL

A collateral in astronomy requires 12 hours, including Astronomy 201, 202, and 203. Astronomy 203, while earning credit toward graduation, will not satisfy any of the four hours of Natural Sciences in the General Education Requirements.

ASTRONOMY COURSES (ASTR)

201 Introduction to Astronomy (4:3-3) (Prerequisite: Eligibility to take Mathematics 111 or Mathematics 121) F, SU. A survey of astronomy, including historical observations and star maps; celestial motions of the sun, moon, planets and stars; electromagnetic radiation, including radiation laws and spectral classification; astronomical instruments and methods; the stars, including formation, evolution, properties, and types of stars; the universe, including the Milky Way Galaxy, other galaxies, theories of formation and evolution. The laboratory section for the class will include work at night in the FMU Observatory.

202 Voyage through the Solar System (4:3-3) (Prerequisite: Eligibility to

take Mathematics 111 or Mathematics 121) AS, SU. A survey of our Solar System, including formation models, orbital properties, and motions of its members; planetary features; asteroids, comets and meteors; comparisons of terrestrial to jovian planets; and planetary atmospheres. The laboratory section for the class will include work at night in the FMU Observatory.

203 Observational Astronomy (4:2-6) (Prerequisite: 201) AS. Introduction to observational astronomy, including telescope design and usage; star maps; constellation figures, bright members and deep sky objects. Attendance will be required each week for at least one night observing session in the FMU Observatory.

PHYSICAL SCIENCE

Coordinator: Mr. Joe H. Mehaffey

MAJOR

No major in physical science is offered.

MINOR

No minor in physical science is offered.

COLLATERAL

No collateral in physical science is offered.

Credit toward graduation may not be earned in both Physical Science 101 and any physics course.

PHYSICAL SCIENCE COURSES (PSCI)

101 Physical Science I: Basic Concepts of Physics and Astronomy (4:3-3) (Prerequisite: Mathematics 105, 110/110L, or eligibility to take Mathematics 111 or 121) F, S, SU. Topics include: astronomy, mechanics, heat, electricity and magnetism, waves and light.

102 Physical Science II: Basic Concepts of Physics and Chemistry (4:3-3) (Prerequisite: Physical Science 101) S, SU. The wave and particle nature of light, optics, atomic structure and processes, including radioactivity and basic chemistry.

103 Physical Science: Basic Concepts of Earth Science (4:3-3) (Prerequisites: Physical Science 101 or Physics 215 or permission of the department) S. Study of the earth's structure and our environment with an emphasis on the processes that shape them. The fundamental principles of geology, meteorology, and oceanography will be covered. Topics include rocks and minerals, the earth's interior, earthquakes and tsunamis, weather and climate, the hydrosphere, natural resources, energy and environmental concerns.

PHYSICS

Coordinator: Dr. Derek W. Jokisch

MAJOR

Students pursuing a major in physics can select a concentration in Computational Physics or a concentration in Health Physics.

A. Computational Physics Concentration

A concentration in computational physics requires completion of:

1. Physics 200, 201, 202, 220, 301, 302, 314, 320, 401, 406, 419, and 420
2. Mathematics 201, 202, 203, 301, and 306
3. Chemistry 101 and 102
4. Computer Science 190 or 212 or 226

In addition to these courses, Mathematics 304, Physics 310, Mathematics 312, Physics 316, and Mathematics/Computer Science 425 are highly recommended.