

Physics

PROGRAM OVERVIEW The basic physics major is designed for students who are interested in a career in industry, government laboratories and applied science or in further study toward a graduate degree.

For students planning to teach junior or senior high school physics, a cooperative program with the School of Education leads to Iowa secondary certification. Students complete a program of physics and education courses and a professional semester, which includes student teaching experience.

Students planning to enter medical or dental school may complete their undergraduate major in physics. This program includes the appropriate courses in biology and chemistry needed to satisfy medical or dental school entrance requirements.

For students who have an interest outside the present fields of concentration but whose educational goals can be realized through a combination of existing courses, an individualized major may be developed. Faculty members counsel students whose interests lie in this direction. Such individualized majors could include computational physics, geophysics, environmental physics, biophysics, chemical physics or astrophysics.

Additional courses are offered in physics and physical science to familiarize the general student with the current scientific interpretations of the fundamental physical laws that govern the universe.

FACULTY The Physics and Astronomy Department is comprised of four full-time professors, all of whom have doctorates, and two part-time assistants. Faculty research interests include Astronomy, Astrophysics, Atomic Physics, Mathematical Physics, Nuclear Physics, and Particle Physics.

ACADEMIC PREPARATION For a student to pursue this field of study he or she must be comfortable with and enjoy mathematics. The discipline relies heavily on deductive and analytical reasoning. An incoming student should have completed four years of math through pre-calculus in high school. A physics course in high school is helpful but not required.

REQUIREMENTS FOR MAJOR The Bachelor of Arts degree requires a minimum of 42 credit hours in physics, and the Bachelor of Science degree requires a minimum of 50 credit hours in physics in a program to be developed by the student and the adviser and approved by the department.

REQUIREMENTS FOR MINOR A minimum of 24 credit hours of physics courses are required for a minor.

DRAKE CURRICULUM The Drake Curriculum, required of all undergraduates, is designed to help students meet personal and professional goals as they acquire fundamental knowledge and abilities

in ten Areas of Inquiry, including communication, critical thinking, artistic experience, historical consciousness, information and technology literacy, international and multicultural experiences, scientific and quantitative literacy, values and ethics and engaged citizenship. Students work closely with their academic advisers to craft a program of study in general education that prepares students for civic and professional leadership.

The Drake Curriculum also requires first-year seminars, which foster development of critical thinking and written and oral communication skills through a topical focus; and a Senior Capstone, in which students demonstrate the capacity to bring information, skills and ideas to bear on one project.

INTERNSHIPS & OPPORTUNITIES Students are encouraged to take advantage of research participation opportunities with professors. Opportunities exist in many areas such as atomic physics, astrophysics, nuclear and particle physics, and quantum theory.

Most upper division students obtain summer internships funded by the NSF through the Research Experiences for Undergraduates (REU) program at laboratories and universities throughout the U.S.

The department maintains two computer laboratories, one teaching laboratory and one research laboratory. The teaching laboratory has nine PC's available to the students. The research laboratory has one computer with a 16 parallel processor architecture, three alpha machines and three Sun workstations. Students doing research participation with professors have access to these machines.

CAREER OPTIONS There is high demand for people with advanced degrees in physics, geophysics, or astrophysics. Any student who is recommended to pursue a masters or doctoral program in any area of physics will receive full financial support from the graduate school involved in the form of fellowships or assistantships which include salary as well as tuition. The undergraduate program also provides a sound base for entering medical or law school.

Physics majors also may pursue career opportunities in industry, government or secondary school teaching. Some career possibilities are as research assistants or in applied computer science at Argonne Labs, Bell Labs, IBM and NASA.

There are many career opportunities for a graduate with a bachelor's degree; however those opportunities are at a less advanced level than for the graduate who pursues a masters or doctoral degree.

HONORS For first-year students, the Department conducts the Drake Physics Prize Examination contest in the spring of each year. The test is offered in high schools in Iowa, Minnesota, South Dakota and North Dakota. The student with the highest test score is awarded a four-year full tuition scholarship. The top 50 senior students are offered the opportunity to apply in a closed competition for a second four-year full

tuition scholarship restricted to physics or astronomy majors. The second scholarship is awarded based on a student's overall academic record, recommendations and an on-campus interview. In addition the Crusinberry Family Endowed Scholarships and Paul S. and Dorothy H. Helmick Scholarships are awarded to undergraduate students who have demonstrated continuing interest and outstanding scholarship in the fields of physics or astronomy. The outstanding junior student is awarded the Helmick Senior Scholarship for his/her senior year and is known as the Helmick Senior Scholar. The outstanding senior student is awarded the Paul S. Helmick prize which consists of a cash award and the inscription of the student's name on a permanent plaque on display in the department office.

STUDENT ORGANIZATIONS AND ACTIVITIES A chapter of the Society of Physics Students is very active at Drake. Activities include volleyball, soccer, picnics, and field trips.

HOW TO REACH US

WRITE

Office of Undergraduate Admission
Drake University
2507 University Ave.
Des Moines, IA 50311-4505

CALL

1-800-44-DRAKE, x3181

LOCAL OR OUTSIDE U.S.

515-271-3181

E-MAIL

admission@drake.edu

INTERNATIONAL E-MAIL

international@drake.edu

SURF

www.choose.drake.edu

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