



Physics

An understanding of the physical universe and how it works; the discovery of those basic laws that govern our physical surroundings; knowledge of the universe and what possible futures may be predicted for it; and the application of modern technologies to questions about nature — these are among the goals of physics.

In pursuing a degree in Physics, students learn theoretical and experimental techniques as they study the laws and properties of motion, heat, light, electricity, radiation, magnetism, and particles and matter. Through participa-

tion in research, teaching, and group problem-solving students gain experience in applying classroom knowledge in many settings.

Students graduating with a Bachelor’s degree in Physics are prepared for advanced study in physics or professional school. Many graduates work in related technical and scientific occupations, while others combine their special expertise with additional skills in such areas as teaching, writing, or marketing products. Many of the skills and abilities acquired by Physics majors are listed below, with representative occupational choices for graduates.

SKILLS & ABILITIES

Students who concentrate in physics develop the ability to solve problems by working with their smaller components. They learn to find out and summarize what is known about physics problems through library literature searches; acquire shop and technical laboratory skills necessary to answer physics questions experimentally; and learn mathematical and computer methods to solve

problems in theoretical physics. Students are offered the opportunity to learn to teach physics by participating in various departmental activities. The ability to summarize research findings, for example, would be used on a daily basis by an astronaut or a patent attorney. The following list presents some examples of the abilities associated with physics majors.

Problem Solving

- Performing calculations
- Modeling complex systems mathematically
- Data analysis
- Reviewing relevant literature
- Designing equipment to perform a desired measure
- Breaking problems into their component parts
- Creating computer simulations

Communication

- Summarizing research findings
- Writing research proposals
- Giving seminars on physics topics
- Teaching basic physics ideas
- Preparing technical reports
- Contributing to project teams

Technical Skills

- Metal shop abilities
- Equipment design
- Electronics design and repair
- Cryogenic methods
- Computer programming

Research/Project Development

- Reviewing literature
- Developing theories
- Testing hypotheses
- Organizing ideas/materials
- Defining/developing/generating ideas
- Integrating theoretical approaches

OCCUPATIONAL OPPORTUNITIES

Physics concentrators are prepared for entry into a wide variety of occupations. They may attend graduate school, work in science, business, education or the professions. Potential career choices are illustrated in the lists below.

For some of these occupations, such as technical writer, expertise in a related area is required. Additional graduate study is generally expected for those occupations marked with a • on the following list.

Research	Business	Education	Government
•Physicist Laboratory manager Technician: laser, accelerator, electronic	Toxic waste manager Sales representative Technical writer	•Science librarian •Professor Teacher (K-12) Lecture demonstration technician	Technician in federal laboratory, e.g., Brookhaven Lab Space technician
•Imaging development physician Medical cyclotron manager	•Operations manager Entrepreneur •Patent attorney/lawyer Troubleshooting consultant •Financial analyst Web designer	•College/university administrator Museum curator/exhibit developer Rehabilitation engineer Popular science writer	•Flight management analyst Military officer Federal/state elected official Drug enforcement agent Science adviser

CURRICULUM REQUIREMENTS

The physics concentration is normally declared after prerequisite courses have been completed. Due to the sequential nature of course offerings, students should use the LS&A Bulletin or talk with concentration advisors to determine the appropriate course of study. However,

students interested in physics are urged to contact the physics department as soon as possible to discuss placement in a research activity and to get advice about course sequencing and research skill training.

FOR MORE INFORMATION

For information about choosing a career, about graduate/professional school, internships, or job descriptions; and for library resources:

The Career Center
3200 Student Activities Building
(734) 764-7460
www.careercenter.umich.edu

For information about the concentration and degree requirements:

Department of Physics
450 Church Street
(734) 764-5539
www.lsa.umich.edu/physics

LS&A Academic Advising Center
1255 Angell Hall
(734) 764-0332