



WESTERN ILLINOIS UNIVERSITY

# Physics

Department of Physics, College of Arts & Sciences

## Why Physics?

Physics plays a basic role in science, engineering, and technology. It deals with the physical world at its most fundamental level by seeking to understand the basic constituents of matter and the forces that bind these constituents into more complex systems.

If you enjoy science and mathematics, are curious about the nature of things, fascinated by advances in technology, you will find the study of physics a challenging and rewarding way to pursue these interests. The study of physics will allow you to develop tangible, marketable skills such as logical thinking, problem solving, the application of mathematics and computers to physical phenomena, and the use of sophisticated measurement techniques. This is the type of training that many employers at top companies are looking for today.

## Physics at Western

The Department of Physics at Western Illinois University is committed to offering every undergraduate and graduate student the opportunity to fully realize his or her potential in an environment dedicated to excellence. The department has a history of teaching excellence and a tradition of involving its students in the excitement and challenges of physics research.

The department offers four-year programs in Physics and Physics Teacher Certification, a minor in Physics, and various pre-professional programs: a 2+2 Pre-Engineering program, a 3+2 dual degree in Engineering Physics and Engineering, and a 1+3 Pre-Architecture program. The department also offers a Master of Science degree in Physics.

Students intending to major in Physics should take as much mathematics and science as possible in high school. Enriched or advanced courses in physics and/or mathematics are highly recommended.

## Faculty

All Physics faculty hold doctoral degrees from distinguished universities around the world such as Texas A&M University, the University of Missouri–Columbia, Peking University (China), the Indian Institute of Science, and the University of Illinois. All of the faculty are enthusiastic and deeply committed to their teaching responsibilities, and they are dedicated to involving students in their active research programs, which results in joint presentations and publications.

All Physics classes (both lecture and laboratory) are taught by faculty members. Our students enjoy a low student-to-faculty ratio. The faculty have a personal stake in the success of each and every student. Faculty members are always very accessible to undergraduate and graduate students alike, and they maintain an open-door policy.

## Scholarships

The Department of Physics offers several scholarships for Physics majors. Freshman scholarships are also available on a merit basis. Detailed information on scholarships is available on the web at [wiu.edu/scholarship](http://wiu.edu/scholarship).

HIGHER VALUES IN HIGHER EDUCATION

## Programs of Study

Students seeking the Bachelor of Science degree in Physics take the University Physics sequence during their first two years, which provides them with a combined theoretical and experimental introduction to all of the basic areas of physics. During their third and fourth years, Physics majors take advanced-level theoretical courses in mechanics, electricity and magnetism, thermodynamics, quantum physics, mathematical methods in physics, and the applications of computer in physics. They also complete laboratory courses in electronics, optics, and modern physics techniques.

Students seeking to certify for secondary teaching take the University Physics sequence during their first two years and, during their third and fourth years, take laboratory courses in electronics and modern physics and additional upper-division Physics courses of their choice. These students are expected to take courses that prepare them in chemistry, biology, and geology as well.

Students who are seeking a career in engineering have several options. The Pre-Engineering program is a 2+2 transfer program designed to enable students to transfer into one of the University of Illinois at Urbana-Champaign's Engineering programs after their sophomore year at Western. Students complete a core sequence in physics and mathematics, as well as core courses in chemistry, computer programming, and drafting. Students who meet the minimum GPA requirements in their core courses have an excellent rate of admission into UIUC or any other engineering program of their choice. The 3+2 dual degree program is designed for students who have a broader academic interest and would like to increase their thinking and reasoning skills as liberal arts Physics majors. By completing Western's General Education sequence for the College of Arts and Sciences and upper division Physics classes, these students will, upon completion of their engineering degree at their transfer institution, also receive an Engineering Physics degree from Western. WIU also offers a Pre-Architecture 1+3 program for students interested in architectural studies.



## Research Opportunities

The Department of Physics has research programs that span from very applied to very fundamental problems in experimental and theoretical physics. Current active areas of research in the department are in Experimental Condensed Matter Physics, Experimental and Theoretical Atomic-Molecular-Optical Physics, NanoScale Materials, and Astrophysics.

Physics faculty are very committed to providing exciting and unique research opportunities for both undergraduates and graduates and to work with them on a one-on-one basis. Physics majors regularly present their results at University, regional, and national student research conferences. Students who carry out original research projects develop critical thinking skills and learn how to work independently as well as in teams. These are precisely the qualities that employers and graduate schools are looking for in applicants, and our majors have been very successful in securing good jobs after graduation or in continuing their education at prestigious graduate programs in engineering as well as in physics. They also often win prestigious national fellowships in their junior or senior years.

## Careers in Physics

Physicists contribute to a wide spectrum of professional activities in research laboratories, engineering and computer science industry, government, education, medicine, and finance. Recent graduates of our program have found employment in fields such as physics research, physics education, industry R&D, computer applications, management, technical sales, and medicine.

The demand for graduates trained in technical fields such as physics is currently very high and does not seem likely to fade in the near future. Physicists are currently among the best paid professionals in science and technology.

With a bachelor's degree in Physics Education, you are also prepared to teach high school physics. There is a strong state and national demand for high school physics teachers, and Western has a long tradition of preparing quality physics educators. If your primary interest is in basic research or in university teaching, you should plan on obtaining a doctoral degree.

[wiu.edu/physics](http://wiu.edu/physics)

### Department of Physics

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