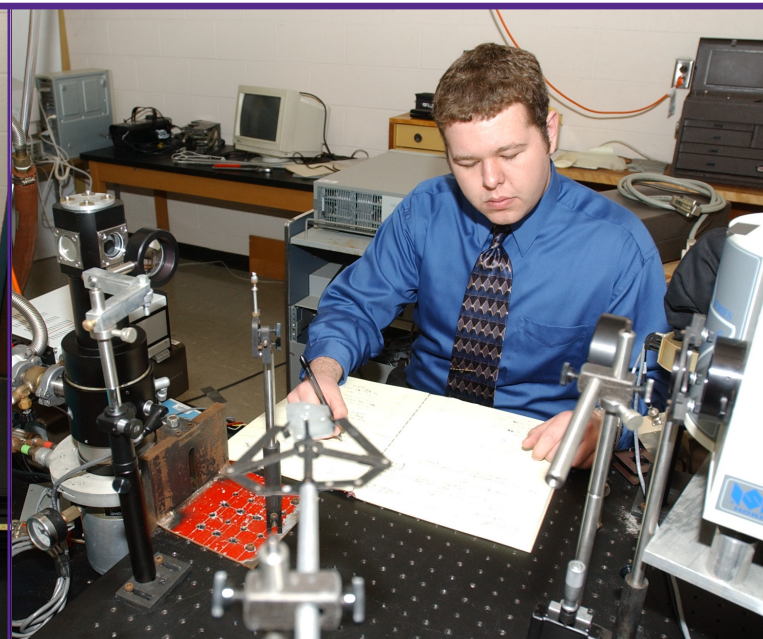
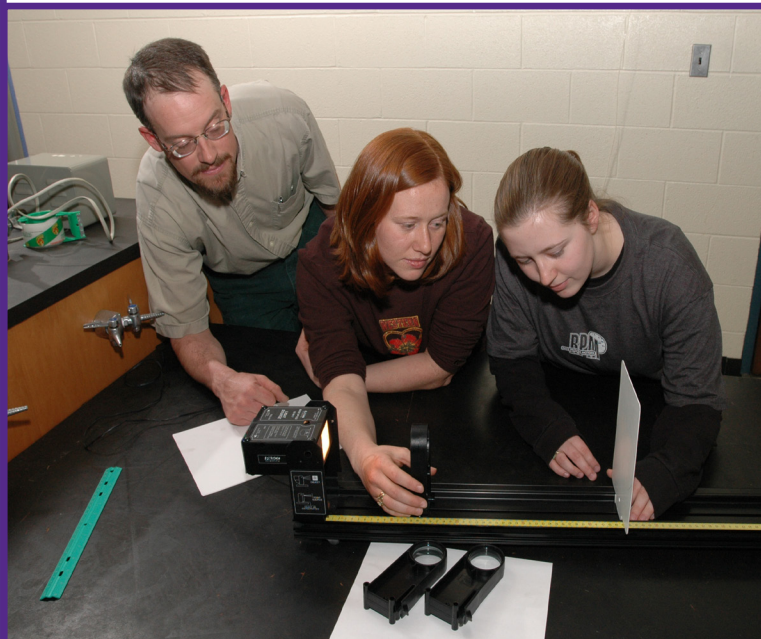


Physics

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 all around us at the most fundamental level, seeking to understand the energy transformations of physical processes and the forces that bind the most basic constituents of matter into more complex systems.

If you enjoy science and mathematics, are curious about the nature of things, and are 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 student the opportunity to realize his or her potential in an environment dedicated to rewarding academic excellence. The department has a long tradition of faculty who are committed to teaching excellence while simultaneously involving their students in the excitement and challenges of faculty-mentored individualized and group research projects.

The department offers four-year programs in Standard Physics and Physics Teacher Certification, a 3+2 (five-year) dual degree program in Engineering Physics and Engineering (field of student's choice), a Standard Minor and a Broad-Area Minor in Physics, and pre-professional programs in the areas of Pre-Engineering (2+2) and Pre-Architecture (1+3). Additionally, the department is one of the first to offer an accelerated five-year program whereby students can complete both the Bachelor of Science and the Master of Science degrees in Physics through an integrated curriculum.

Students who intend to major in Physics are encouraged to take as much mathematics and science as possible in high school, especially the advanced courses.

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 a number of scholarships for Physics majors for which they apply on a competitive basis, including several Freshman Physics Scholarships. Detailed information on scholarships is available at wiu.edu/scholarship/prospective.php; search for the keyword "physics."

Programs of Study

Students seeking the Bachelor of Science degree in Physics take the four-semester University Physics calculus-based lecture and laboratory sequence (PHYS 211, 212, 213, and 214) during their first two years, which provides them with a combined theoretical and experimental introduction to all basic areas of physics. During their third and fourth years, they complete advanced-level courses in mechanics (PHYS 311), electricity and magnetism (PHYS 320 and 421), thermodynamics (PHYS 354), quantum physics (PHYS 430 and 431), and possibly astrophysics (PHYS 476). They will also complete advanced-level laboratory courses in optics (PHYS 428), electronics (PHYS 427), and modern experimental techniques (PHYS 470). Furthermore, they are provided with the opportunity to take additional courses on the use of mathematical (PHYS 467 and 468) and computational techniques (PHYS 410) in physics during their second and third years, along with the capstone seminar course (PHYS 490) in their fourth year.

Students seeking to be certified for secondary science teaching (physics emphasis) take the same four-semester calculus-based lecture and laboratory sequence during their first two years, and during their third and fourth years, will complete advanced-level laboratory courses in optics and electronics, with additional upper-division physics electives of their choice.

For those students seeking careers in engineering, the 3+2 (five-year) dual degree program in Engineering Physics and Engineering (in the student's chosen field) is an excellent choice. It is designed to enable students to smoothly transfer into one of the Engineering programs at the University of Iowa or at the University of Illinois at Urbana-Champaign (UIUC) after their junior year at Western. These students take the same four-semester calculus-based lecture and laboratory sequence during their first two years, and in their third year, complete a few advanced-level Physics courses that will be most applicable toward their further studies in engineering. Upon completion of their engineering degree in their chosen field at their transfer institution, they also receive an Engineering Physics degree from Western. The Engineering Physics program is especially designed for students who wish to increase their thinking and reasoning skills and benefit from a stronger scientific background in their career as a practicing engineer.



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, the 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 of Science degree in Physics Education, you are also prepared to teach high school physics. There is currently a strong state and national demand for high school physics teachers, and Western has a long tradition of preparing quality physics educators across the state as well as beyond Illinois.

If your primary interest is in basic research or in university teaching, you should plan on pursuing the doctoral (Ph.D.) degree in Physics. In this case, you should definitely consider Western's accelerated five-year program whereby students can complete both the Bachelor of Science and the Master of Science degrees in Physics through an integrated curriculum. This will best enable you to enter a nationally ranked physics doctoral program of your choice both well-prepared and in a timely fashion.

wiu.edu/physics

Department of Physics

Currens Hall 212 • Western Illinois University
1 University Circle • Macomb, IL 61455-1390
Phone: (309) 298-1596



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