



Physics

College of Science & Health

Physics Degree Programs

Dual Degree Program in Physics & Engineering

Dual Degree Program in Physics & Physical Therapy

Physicists are highly trained in experimental techniques, mathematical analysis, and computational techniques. This training enables physicists to be very flexible and adaptable, making them highly sought-after in the job market. The Physics Department at UW-La Crosse has several innovative programs specifically designed to help students seek employment in today's high-tech industries and provide excellent preparation for students wishing to continue on to graduate school.

In addition to our unique programs, the department also stands out in its emphasis on student involvement in faculty research projects. This mode of instruction is complementary to the traditional classroom or laboratory. Students typically work with a faculty member on a part-time basis for several semesters and have an opportunity to experience real world, open-ended research problems. Research projects are available in the following areas: astrophysics, biomechanics, computational physics, laser spectroscopy, quantum computing, material science, nuclear physics, solid-state physics, and physics education.

Undergraduate Programs

Majors:

- Physics*
With emphases in:
Astronomy
Computational Physics
Optics
- Physics with Biomedical Concentration
- Physics with Business Concentration
- Physics/Engineering Dual Degree
- Physics/Physical Therapy Dual Degree
- Secondary Physics Education

Minors:

- Physics*
- Physics with Astronomy Emphasis
- Secondary Physics Education

Department Highlights

- The UW-L Physics Department received national recognition as a thriving undergraduate physics program by the National Task Force on Undergraduate Education.
- The Department received the "Teaching Excellence Award"

from the Board of Regents, UW-System in 2004.

- Faculty in the Department have received over \$1.5 million dollars in external funding from the National Science Foundation, NASA and other external agencies to support faculty and student research activities.
- Students in the Department have received a number of awards, fellowships and scholarships based on their academic performance and ability to excel in research. This includes the following nationally competitive awards: Barry M. Goldwater Scholarship (three recipients), Department of Homeland Security Undergraduate Scholarship and research fellowships from the Council on Undergraduate Research, the Society of Physics Students, the American Physical Society, NASA, and multiple REU programs throughout the country.
- The Department hosts an annual Distinguished Lecture Series, whereby a Nobel Laureate in Physics visits UW-L to inspire and enrich the careers of students, faculty and the community in general.
- The Department offers several internship and scholarship opportunities for incoming freshmen. More information can be found on our web page.

Degree Programs

The physics major is the regular program for students interested in a broad study of physics and for those wishing to obtain the best possible preparation for physics graduate school. Additionally, emphases are available in the following areas:

Astronomy Emphasis

This emphasis is designed for students who have a strong interest in astronomy. It is the ideal preparation for astronomy graduate school. There are excellent student research opportunities in the study of interstellar gas and theoretical astrophysics. The department has a fully operational planetarium.

Computational Physics Emphasis

This program is designed for students who are interested in computer modeling and high performance computation in scientific and engineering problems. It is excellent for students who wish to work in modern industry or government (e.g. NASA).

Optics Emphasis

This is an excellent preparation for students wishing to pursue a career in modern high-tech fields. Students develop a solid understanding of electronics, quantum optics, and lasers. This emphasis is also an excellent alternative to obtaining a

standard engineering degree, allowing one to pursue optics-specific graduate programs and engineering fields.

Biomedical Concentration

This program is designed to provide a strong background in physics, and prepare students for (1) graduate studies in Biomedical Engineering, Physical Therapy, and Medical School, and (2) entry-level positions in industry and government in the field of biotechnology.

Business Concentration

Modern industry has a serious shortage of business managers with a solid grounding in the hard sciences. This concentration is designed for students who wish to enter business with the advantage of an excellent understanding of such areas as electronics, lasers, computers, etc.

Secondary Physics Education

This integrated program provides an excellent background in physics and certification to teach physics at the high school and middle school level.

Sample Courses

- General Physics
- Optics and Advanced Optics
- Advanced Electrodynamics
- Astrophysics and Cosmology
- Circuits and Electronics
- Advanced Quantum Mechanics
- Bioinstrumentation
- Biomechanics
- Physics and Astronomy Research

Career Opportunities

Entry Level

- Engineering Physicist
- High School Science Teacher (with teacher certification)
- Optical Engineer

- Planetarium Director
- Research Physicist (government or private industry)
- Laboratory Scientist
- Space Scientist
- Environmental Analyst
- Sales Representative
- Technical Writer

Further Education

- Business Management
- Graduate study in astronomy, physics, chemistry, mathematics, engineering, computer science
- Medical School
- Law School

Long Term Career Development

- College or University Instructor (with advanced degree)
- Engineer
- Director of Research and Development
- Medical Physicist
- Industrial Administrator
- Patent Attorney
- Plant Manager

Occupational Outlook

Students seeking employment with a degree in physics from UW-L have a wide variety of opportunities because of the diverse nature of the physics program. There are many opportunities to work in modern industries in applied physics or engineering-physics. Physicists find employment in research and design, quality control and testing, mathematical and computer modeling, and in sales of technical equipment.

In the medical field, a physicist may supervise the operation of a multitude of clinical instruments found in a hospital or assist in diagnosis and therapy using nuclear radiation, x-ray, and ultrasound techniques. Medical physics is a growing area with many employment opportunities. In addition, physicists often find themselves doing exactly the types

of things that an engineer would do, such as designing electronic circuits and computers, working in manufacturing industries, and performing basic and applied research. It is common for physicists and engineers to work side by side. Because of the relative shortage of qualified physicists, employment prospects are excellent. A *dramatic* shortage of female physicists makes the prospects for women physicists outstanding!

Dual-degree Programs

Physics and Engineering

This dual degree program allows a student to receive both a Bachelor of Science (Physics major) from UW-L and a Bachelor of Science (Engineering major) from UW-Madison, UW-Milwaukee, UW-Platteville or the University of Minnesota. The total length of time for both degrees is expected to be five years with approximately three years at UW-L and approximately two years at one of the engineering schools.

Physics and Physical Therapy

This dual degree program allows qualified students the opportunity to receive both a Bachelor of Science (Physics major with Biomedical Concentration) and a Doctor of Physical Therapy degree from UW-La Crosse. The total length of time for both degrees is expected to be about six years, with approximately three years in the Physics program and approximately three years in the Physical Therapy program.

Additional Information

UW-L Physics Department
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