

PROGRAMS AVAILABLE: Bachelor of Science | Minor

Develop the technical skills that will prepare you to work in the forefront of science and technology.

The most fundamental of the sciences, physics is the basis for all our understanding of the physical world, from the smallest subatomic particles, to the human body, to the largest galaxies. Physics fires our imagination by touching on important philosophical questions in theories of relativity and quantum mechanics, while at the same time having endless practical applications in fields such as biology, medicine, engineering and sustainable energy technology.

If you like to use your hands and your mind to explore the physical world and solve problems, a degree in physics is a great option. The analytical and technical skills you develop will be broadly applicable in a wide variety of career options.

After completing a BS in Physics, you will also be well-prepared for graduate study in physics or engineering, including Creighton's 5-year Master's Program in Physics.

WHAT YOU'LL LEARN

- Understanding of nature through sequenced study of the core areas of physics as well as a wide variety of elective courses.
- Conceptual and mathematical problem solving abilities, and solve real-world problems both in the classroom and in research with faculty.
- Design, build and conduct laboratory experiment that test scientific hypotheses. You'll also learn to analyze data and apply statistics and error analysis to understand and validate experimental results.
- To work independently and collaboratively on difficult and open-ended questions.
- To effectively communicate science to a variety of audiences in a variety of formats.

EXPERIENTIAL LEARNING OPPORTUNITIES

Physics majors at Creighton have the opportunity to participate in a wide variety of cutting-edge research opportunities. In fact, all our majors participate in faculty-led research at some point in their careers, some starting as early as their freshman year. Most will give presentations about their work at regional and national meetings, and some even become published authors before graduation. Creighton physics students have also had great success competing for prestigious summer research and internship opportunities at national labs and major research universities.

At Creighton, students have the chance to do hands-on work:

- Studying the biological and medical applications of physics,
- Conducting materials science research to develop better materials for a variety of applications, including solar cells and dental materials,
- Participating in observational astrophysics and the study of quasars,
- Studying the fascinating behavior of atoms at temperatures approaching absolute zero,
- Learning about glass formation and its properties, including fragility,
- Investigating the role of physics education and how to improve it, and
- Participating in two large, international collaborations studying high-energy physics, including traveling to the research facilities at Brookhaven National Laboratory (on Long Island, NY) and CERN (in Geneva, Switzerland).

CAREER OUTLOOK

Creighton's physics program is designed to combine a solid foundation in physics with adaptability to a wide range of personal interests and career objectives. Graduates with solid scientific backgrounds are in high demand.

Our programs lay the foundation for careers in fields, such as Physics research, Astronomy and Astrophysics, Engineering (including Biomedical Engineering), Medicine, Medical Physics, Materials Science, Law, Dentistry, Education, Financial Analysis, Applied Mathematics and more.

CAREER OUTCOMES

Employment Opportunities

Almost all our graduates who pursue employment directly after graduation find a placement. Creighton faculty, and alumni go the extra mile to help graduates find optimal job placements for companies and government agencies, such as:

- University of Iowa
- Fidelity National Financial
- University of Nebraska Medical Center
- Capuchin Volunteer Corps
- Cerner Corporation

Graduate Studies

Many of our students have gone on to prestigious graduate programs and schools, such as:

- Rice University
- John Hopkins
- Massachusetts Institute of Technology
- Mayo Catholic University
- Creighton University
- Mayo Graduate School
- Catholic University
- Iowa State / Ames National Laboratory

PHYSICS MINORS

In addition to the Physics major, two minors are available.

Biological Physics Minor

The biological physics minor provides you with an opportunity to apply the concepts and methods of the physicist to advance your understanding of the life sciences. Students pursuing careers in medicine or the life sciences can use this minor to improve their preparation for the interdisciplinary nature of modern science.

Physics Minor

The physics minor provides a thorough introduction to the theoretical and experimental methods extensively used by physical scientists and engineers. You'll develop practical quantitative problem-solving skills, which are valuable regardless of your major

For more details on the full curriculum for both the major and the two minors, visit:

<http://catalog.creighton.edu/undergraduate/arts-sciences/physics/#degreestext>

PHYSICS COURSES

Course Requirements:

PHY 213	General Physics for the Physical Sciences I	3
PHY 205	General Physics Laboratory I	1
PHY 214	General Physics for the Physical Sciences II	3
PHY 206	General Physics Laboratory II	1
PHY 301	Modern Physics	3
PHY 302	Modern Physics Laboratory	1
PHY 303	Electronics Laboratory	1
PHY 331	Physical Optics	3
PHY 332	Optics Laboratory	1
PHY 471	Classical Mechanics	3
PHY 481	Electricity and Magnetism	3
PHY 491	Seminar	1
PHY 531	Quantum Mechanics	3
PHY 541	Thermodynamics And Statistical Mechanics	3

Advanced Lecture Electives:

PHY 351	Physics in Medicine	3
PHY 353	Introduction to Biological Physics	
PHY 522	Electric Circuits	
PHY 551	Mathematical Physics	
PHY 553	Computational Physics	
PHY 559	Gravitation and Cosmology	
PHY 561	Nuclear Physics	
PHY 563	High Energy Nuclear Physics	
PHY 571	Condensed Matter Physics	
PHY 587	Laser Physics	
PHY 595	Special Topics	

Advanced Laboratory Electives:

PHY 497	Directed Independent Research	3
PHY 581	Advanced Laboratory I	
PHY 582	Advanced Laboratory II	

Total Credits

36

STUDENT ORGANIZATIONS AND ACTIVITIES

Sigma Pi Sigma

Sigma Pi Sigma is the national honor society in physics, with hundreds of chartered chapters throughout the country. Creighton University's chapter, The Society of Physics Students, was chartered in 1982.

The society awards distinction to students of high scholarship and promotes student interest in research and advanced study, and encourages a spirit of friendship and professionalism among members. It also promotes interest in physics on campus.

Astronomy Club

Creighton's Astronomy Club offers astronomical viewing opportunities to the campus and local community. Physics Department Retreat: Each spring the physics department holds their annual retreat in which students, staff and faculty come together at a local retreat center to bond together and explore the Catholic and Jesuit elements of our mission. Evening of Reflection: The department gathers each spring shortly before graduation to honor graduating students and reflect on the year that is coming to a close.