Applied Physical Analysis

College of Arts and Sciences

Creighton UNIVERSITY

PROGRAMS AVAILABLE: Bachelor of Science

Experience a comprehensive, hands-on education in the central science.

Creighton University's Bachelor of Science (B.S.) program in Applied Physical Analysis is an interdisciplinary course of study that will prepare you for a career involving the quantitative analysis of data. When you pursue a B.S. in Applied Physical Analysis, you'll learn concepts in physics, mathematics and computer science that provide the background required for graduate study in engineering. In addition, special opportunities for hands-on experience in solar energy technology are available.

As an Applied Physical Analysis major, you'll gain an understanding of the physical world and the application of statistical analysis to physical measurements, as well as develop the ability to effectively present the results of quantitative studies.

You may choose to transfer to an engineering school after graduation or at an earlier point in your academic career. If you wish to earn an engineering degree after earning your Creighton degree, an Applied Physcial Analysis science major in the physics department is a great foundation.

WHAT YOU'LL LEARN

- You will develop your conceptual and mathematical problem solving abilities, and solve real-world problems both in the classroom and in research with faculty.
- You will learn to design, build and conduct laboratory experiments that test scientific hypotheses. You'll also learn to analyze data and apply statistics and error analysis to understand and validate experimental results.
- You will develop strong mathematical, statistical and computational skills that are transferable to any field of science or engineering.
- You will learn to work independently and collaboratively on difficult and open-ended questions.
- You will learn to effectively communicate science to a variety of audiences in a variety of formats.
- Your technical education will be integrated into the broad tradition of a Catholic and Jesuit liberal arts education. As such, you will explore the ethical responsibilities and dimensions of the pursuit of science.
- All of these skills are excellent preparation for graduate or professional studies in a variety of fields, but are also highly transferable and valued in the job market. An education in physics opens many doors.

EXPERIENTIAL LEARNING OPPORTUNITIES

Applied Physical Analysis 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 Applied Physical Analysis students have also had great success competing for prestigious summer research and internship opportunities at national labs and major research universities.

CAREER OUTLOOK

The Applied Physical Analysis program provides a strong foundation for careers in the rapidly developing high-tech industries. Graduates find an unusual flexibility in career choice and exceptional strength and stability in the job market.

All of Creighton's physics programs are designed to combine a solid foundation in physics with adaptability to a wide range of student interests and career objectives.

CAREER OUTCOMES

Employment Opportunities

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

- Kiewit Engineering
- U.S. Department of Energy
- U.S. Air Force
- Amadeus Consulting Group

Graduate Studies

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

- University of Nebraska
- Creighton University Law School
- Creighton University Heider College of Business

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For more details on the full curriculum, visit:
http://catalog.creighton.edu/undergraduate/arts-sciences/physics/applied-physical-analysis-bs/

COURSE REQUIREMENTS

PHY 213	General Physics for the Physical Sciences I	3
PHY 214	General Physics for the Physical Sciences II	3
PHY 205	General Physics Laboratory I	1
PHY 206	General Physics Laboratory II	1
PHY 471	Classical Mechanics	3
PHY 591	Seminar in Engineering	1
MTH 545	Differential Equations	3
MTH 561	Mathematical Statistics I	3
MTH 562	Mathematical Statistics II	3
Select one of the following:		**3**
CSC 221	Introduction to Programming	
PHY 553	Computational Physics	
Select one of the following:		**3**
PHY 497	Directed Independent Research	
ERG 497	Directed Independent Research	
Select nine credit hours from the following:		**9**
CSC 222	Object-Oriented Programming	
CSC 321	Data Structures	
CSC 414	Introduction To Computer Organization	
CSC 421	Algorithm Design and Analysis	
CSC 533	Programming Languages	
CSC 548	Software Engineering	
CSC 590	Special Topics	
ERG 213	Three Dimensional Design	
ERG 221	Electronics Design	
ERG 241	Introduction to Energy Transfer	
ERG 251	Introduction to Material Science	
MTH 529	Linear Algebra	
MTH 543	Numerical Analysis	
MTH 546	Partial Differential Equations	
MTH 571	Operations Research	
MTH 572	Fuzzy Logic	
MTH 573	Probabilistic Models	
MTH 575	Introductory Stochastic Processes	
PHY 301	Modern Physics	
PHY 303	Electronics Laboratory	
PHY 331	Physical Optics	
PHY 332	Optics Laboratory	
PHY 481	Electricity and Magnetism	
PHY 491	Seminar	
PHY 541	Thermodynamics And Statistical Mechanics	
PHY 551	Mathematical Physics	
PHY 553	Computational Physics	
PHY 561	Nuclear Physics	
PHY 571	Condensed Matter Physics	
PHY 581	Advanced Laboratory I	
PHY 582	Advanced Laboratory II	
PHY 587	Laser Physics	

A full class list can be found on the Creighton catalog.

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.