

# EXTREME ULTRAVIOLET AND OPTICAL SCIENCE AND TECHNOLOGY GRADUATE INTERDISCIPLINARY STUDIES PROGRAM

Coordinated by a Faculty Advisory Board and the Department of Electrical and Computer Engineering (<https://www.engr.colostate.edu/ece/>) in the Walter Scott, Jr. College of Engineering (<https://www.engr.colostate.edu/>).

The Extreme Ultraviolet and Optical Science and Technology Graduate Interdisciplinary Studies program is designed to serve individuals who are seeking to gain knowledge and experience in the generation and applications of coherent extreme ultraviolet or soft x-ray light. This type of light holds great potential in applications in nanotechnology, nanoelectronics, photochemistry, material science, and biology. While, in the past, the use of coherent EUV light required a trip to a national facility, new developments in compact sources make it widely available. The objective of the program is to provide scientists or engineers many of the fundamentals required to generate or proficiently make use of this portion of the electromagnetic spectrum.

This interdisciplinary studies program is inherently interdisciplinary, including lasers, optical, plasma, material, chemical and biological sciences, and engineering. With its NSF Center for Extreme Ultraviolet Science and Technology (<https://euverc.colostate.edu/>), a partnership with the University of Colorado and the University of California, Berkeley, CSU has unique expertise in this area.

The program is open to graduate students and professionals who hold a B.S. degree in engineering, physics, chemistry, biology, mathematics, or other scientific discipline.

The program requires a total of fifteen credits comprising six core credits and nine electives. The six core credits are two very fundamental courses any graduate student with a background in hard sciences and engineering could master. This, coupled with the fact that graduate students in any discipline are not held to undergraduate prerequisite courses, make this interdisciplinary studies program widely accessible. Elective credits are tailored to the candidate's interests from the major the student pursues. Within these, a course in another discipline outside the major of the candidate must be included.

## Requirements Effective Fall 2008

Additional coursework may be required due to prerequisites.

Code	Title	Credits
<b>Core Courses</b>		
ECE 504	Physical Optics	3
ECE 650	Extreme Ultraviolet and Soft X-Ray Radiation	3
<b>Elective Courses</b>		
Select 9 credits from the following:		9

BC 511	Structural Biology I
BC 565	Molecular Regulation of Cell Function
BC 611	Structural Biology II
CHEM 532	Advanced Chemical Analysis II
CHEM 563A	Physical Methods in Inorganic Chemistry: Group Theory
CHEM 571A	Quantum Chemistry: Foundations
CHEM 571B	Quantum Chemistry: Electronic Structure
CHEM 773	Atomic and Molecular Spectroscopy
ECE 503	Ultrafast Optics
ECE 505	Nanostructures: Fundamentals and Applications
ECE 506	Optical Interferometry and Laser Metrology
ECE 507	Plasma Physics and Applications
ECE 546	Laser Fundamentals and Devices
MATH 560	Linear Algebra
PH 451	Introductory Quantum Mechanics I
PH 452	Introductory Quantum Mechanics II
PH 521	Introduction to Lasers
PH 522	Introductory Laser Laboratory
PH 572	Mathematical Methods for Physics II
PH 641	Electromagnetism I
PH 642	Electromagnetism II
PH 651	Quantum Mechanics I
PH 652	Quantum Mechanics II

**Program Total Credits: 15**