MATERIALS SCIENCE, GRADUATE CERTIFICATE

Scientific breakthroughs and technological development now often require an interdisciplinary understanding of relationships between materials, properties, and fabrication processes in sectors and products including, but not limited to, glass, solar, semiconductors, energy, steel, biomedical devices and others. The Graduate Certificate in Materials Science focuses on key aspects of materials including structure, defects, diffusion, equilibria, phase transformations, and growth including behavior at the nanoscale through two core courses in these topics. Choices of two additional courses in concepts and applications enable exploration of individual interests relevant to the field of your choice.

The Materials Science, Graduate Certificate requires a minimum of 14 credit hours.

Code	Title	Hours
Select one of the following		4
PHYS 6540	Structure, Defects And Diffusion	
CHEM 6810	Materials Science I	
Select one of the following		4
PHYS 6550	Thermodynamics And Phase Transformations In Condensed Systems	
CHEM 6820	Materials Science II	
Select two of the following		6-8
PHYS 6280	Photovoltaic Materials And Device Physics Laboratory	
PHYS 6450	Statistical Mechanics	
PHYS 6630	Semiconductors I	
PHYS 6640	Fundamentals of Solar Cells	
PHYS 6980	Special Topics	
PHYS 6990	Independent Study	
CHEM 6310	Separation Methods	
CHEM 6320	Electrochemistry	
CHEM 6800	Advanced Materials Chemistry	
CHEM 6830	Nanomaterials Science	
CHEM 6850	X-Ray Crystallography	
CHEM 6980	Special Topics In Chemistry	
Total Hours		**14-16**

- Demonstrate an understanding of foundational concepts in chemistry and physics as applied to materials science.
- Demonstrate an understanding of material structure, defects, diffusion, equilibria, phase transformations, and growth and implications for classes of materials, materials characterization, or applications.
- Communicate technical information clearly and accurately in written, oral, and visual formats.
- Locate and use information in the primary literature and research databases.
- Critically read, assess, and evaluate scientific publications, presentations, and data.
- Understand and observe proper safety, ethical, and professional practices.
- Apply scientific skills in an interdisciplinary scientific context.
- Demonstrate understanding of the relationships between process-property relationships spanning from the fundamental theoretical formalism to final materials or device behavior.