MATERIALS SCIENCE AND ENGINEERING CGS

All students must meet the Requirements for Certificate of Graduate Study.

OVERVIEW

The Certificate of Graduate Study in Materials Science and Engineering aims to provide a unique and relevant learning program to prepare graduates to work in materials industries or pursue doctoral or postdoctoral studies in this important interdisciplinary field.

The field of materials science is critical to modern society and essential to the Nation's economic well-being and security. It holds particular significance for Vermont and the neighboring regions due to its historical and ongoing relevance to local industries. Recent federal investments in several regional technology sectors directly connected to materials science are creating new opportunities for graduating students in fields including advanced materials, advanced manufacturing, biotechnology, energy technology, quantum information science, and semiconductors and microelectronics.

The Certificate of Graduate Study in Materials Science and Engineering will certify that graduate students have received specific instruction and experiences in structure and bonding of materials, advanced materials characterization, and fundamental properties of materials. A range of preapproved elective courses allows students to tailor their program to emphasize fields of interest, including biomaterials, semiconductors, and engineering materials.

SPECIFIC REQUIREMENTS

A notable feature of the CGS in Materials Science and Engineering program is its strong emphasis on experiential learning through laboratory components. The curriculum consists of three to four foundation courses, followed by one to two electives in areas of Physics, Chemistry, or Engineering related to materials science. 13 credits are required to earn the Certificate of Graduate Study in Materials Science and Engineering.

Minimum Degree Requirements

Requirement Description		Credits
At least 7 credits from the following list:		
ME 5120	Adv Engineering Materials	3
PHYS 5625	Structure&Bonding of Materials	3
or MATS 5625	Structure&Bonding of Materials	
PHYS 5185	Nano-analysis of Materials	1
or MATS 5185	Nano-analysis of Materials	
CHEM 5610	Gr Chemical Thermodynamics	3
or MATS 5610	Gr Chemical Thermodynamics	
Preapproved electives (3 to 6 credits minimum)		
BME 5150	Nanobiomaterials	
BME 5440	Biothermodynamics	
or ME 5440	Biothermodynamics	
CHEM 6300	Topics in Analytical Chemistry	
CHEM 6600	Topics in Physical Chemistry	
CHEM 6620	Computational Chemistry	
EE 5440	Gr Semiconductor Materials/Dev	
or PHYS 5675	Gr Semiconductor Materials/Dev	
ME 5160	Continuum Mechanics	
ME 6110	Mechanical Behavior of Solids	
ME 6550	Multiscale Modeling	
PHYS 5400	Statistical Mechanics	
Core and elective credits should total at least 13 credits		