

# Nanomedicine, Graduate Certificate (Boston)

The Graduate Certificate in Nanomedicine is a part-time program designed to introduce scientists, engineers, and physicians to interdisciplinary problem solving in nanomedicine. This experiential learning program is ideal for individuals seeking careers in biotechnology, pharmaceutical, biomedical, or clinical fields. Students study both fundamental and applied aspects of nanomedicine and then apply this knowledge to designing strategies for nanomedicine innovation, translation, and commercialization. The graduate certificate consists of 8 semester hours of NNMD coursework and one elective, totaling 12 semester hours.

## Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

### Core Requirements

Code	Title	Hours
<b>Required Core</b>		
NNMD 5270	Foundations in Nanomedicine: Therapeutics	3
or NNMD 5271	Foundations in Nanomedicine: Diagnostics	
Complete at least 5 semester hours from the following:		5
NNMD 5272	Nanomedicine Seminar (may be repeated)	
NNMD 5310	Bioethics in the Age of Artificial Intelligence	
NNMD 5370	Nanomedicine Research Techniques	
NNMD 5380	Electron Microscopy Techniques	
NNMD 5470	Nano/Biomedical Commercialization: Concept to Market	
NNMD 5570	Preclinical and Clinical Study Design	

### Electives

Code	Title	Hours
Complete 4 semester hours of electives from the following list. Electives not on this list may be chosen with faculty advisor approval:		4
<i>Laboratory Research</i>		
BIOL 6381	Ethics in Biological Research	
BIOT 5145	Biotechnology Lab Skills	
BIOT 7245	Biotechnology Applications Laboratory	
NNMD 5370	Nanomedicine Research Techniques	
NNMD 5380	Electron Microscopy Techniques	
NNMD 5570	Preclinical and Clinical Study Design	
NNMD 6370	Nanomedicine Experiential Capstone	
NNMD 6984	Independent Research	
PHSC 5212	Research Skills and Ethics	
PHSC 6214	Experimental Design and Biostatistics	
<i>Nanomaterials Design and Application</i>		
BIOE 5820	Biomaterials	
BIOE 6100	Medical Physiology	
BIOT 5630	Cell Culture Applications for Biopharmaceuticals	
BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations	
BIOT 5910	Vaccines and Immunization	
BIOT 5930	Molecular Tools for Vaccine Design	
CHEM 5610	Polymer Chemistry	
CHEM 5640	Biopolymeric Materials	
CHME 5630	Biochemical Engineering	
CHME 5631	Biomaterials Principles and Applications	
CHME 5683	Introduction to Polymer Science	
NNMD 5270	Foundations in Nanomedicine: Therapeutics	
NNMD 5271	Foundations in Nanomedicine: Diagnostics	
PHSC 6216	Human Physiology and Pathophysiology	

PHSC 6290	Biophysical Methods in Drug Discovery
PHYS 5260	Introduction to Nanoscience and Nanotechnology
PHYS 7731	Physics of Biological Processes and Living Systems 1
<i>Drug Delivery</i>	
CHEM 5648	Chemical Principles and Application of Drug Metabolism and Pharmacokinetics
CHME 5160	Drug Delivery: Engineering Analysis
CHME 7350	Transport Phenomena
PHSC 5560	Nanotoxicity
PMST 6252	Pharmacokinetics and Drug Metabolism
PMST 6254	Advanced Drug Delivery Systems
<i>Commercialization and Regulatory Affairs</i>	
BIOT 5219	The Biotechnology Enterprise
BIOT 5220	The Role of Patents in the Biotechnology Industry, Past and Future
BIOT 5225	Managing and Leading a Biotechnology Company
BIOT 5227	Launching Your Science: Biotechnology Entrepreneurship
BIOT 5920	Foundations in Vaccine Regulatory Science
BIOT 6290	Foundation in Quality for Biotechnology
BIOT 6310	CGMP Statutes and Regulation
BIOT 6320	Design and Development of Biopharmaceuticals
BIOT 6340	Sterile Manufacturing Operations
NNMD 5470	Nano/Biomedical Commercialization: Concept to Market

### Program Credit/GPA Requirements

12 total semester hours required

Minimum 3.000 GPA required