Bioinformatics, Graduate Certificate (Boston)

The Graduate Certificate in Bioinformatics seeks to provide students with core knowledge in bioinformatics programming, integrating knowledge from the biological, computational, and mathematical disciplines. Students have an opportunity to gain the data and genomic analysis skills needed to employ bioinformatics techniques to biological problems. The graduate certificate consists of four courses, three bioinformatics courses and one elective, totaling 15–16 semester hours.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

Code	Title	Hours
BINF 6200	Bioinformatics Programming	4
BINF 6310	Introduction to Bioinformatics	4
BINF 6400	Genomics in Bioinformatics	4
or BINF 6430	Transcriptomics in Bioinformatics	

Elective

Code	Title	Hours
Complete one of the following (electives outside this list may be chosen in consultation with faculty advisor):		3-4
BINF 6400	Genomics in Bioinformatics	
BINF 6420	Omics in Bioinformatics	
BINF 6430	Transcriptomics in Bioinformatics	
BIOE 5235	Biomedical Imaging	
BIOE 5410	Molecular Bioengineering	
BIOE 5420	Cellular Engineering	
BIOE 6100	Medical Physiology	
BIOL 5543	Stem Cells and Regeneration	
BIOL 5549	Inventions in Microbial Biotechnology	
BIOL 5573	Medical Microbiology	
BIOL 5581	Biological Imaging	
BIOL 5583	Immunology	
BIOL 5585	Evolution	
BIOL 5587	Comparative Neurobiology	
BIOL 5591	Advanced Genomics	
BIOL 5593	Cell and Molecular Biology of Aging	
BIOL 5597	Immunotherapies of Cancer and Infectious Disease	
BIOL 6299	Molecular Cell Biology for Biotechnology	
BIOL 6300	Biochemistry	
BIOL 6301	Molecular Cell Biology	
BIOL 6303	Neurobiology and Behavior	
BIOT 5120	Foundations in Biotechnology	
BIOT 5145	Biotechnology Lab Skills	
BIOT 5219	The Biotechnology Enterprise	
BIOT 5225	Managing and Leading a Biotechnology Company	
BIOT 5227	Launching Your Science: Biotechnology Entrepreneurship	
BIOT 5560	Bioprocess Fundamentals	
BIOT 5635	Downstream Processes for Biopharmaceutical Production	
BIOT 5640	Drug Product Processes for Biopharmaceuticals	
BIOT 5700	Molecular Interactions of Proteins in Biopharmaceutical Formulations	
BIOT 5810	Cutting-Edge Applications in Molecular Biotechnology	
BIOT 5850	Higher-Order Structure Analytics	
BIOT 7245	Biotechnology Applications Laboratory	
CHEM 5550	Introduction to Glycobiology and Glycoprotein Analysis	

CHEM 5617	Protein Mass Spectrometry Laboratory
CHEM 5620	Protein Chemistry
CS 5010	Programming Design Paradigm
CS 5100	Foundations of Artificial Intelligence
CS 5200	Database Management Systems
CS 5400	Principles of Programming Language
CS 5500	Foundations of Software Engineering
CS 5600	Computer Systems
CS 5610	Web Development
CS 5700	Fundamentals of Computer Networking
CS 5800	Algorithms
CS 6140	Machine Learning
CS 6200	Information Retrieval
CS 6220	Data Mining Techniques
DA 5020	Collecting, Storing, and Retrieving Data
DA 5030	Introduction to Data Mining/Machine Learning
INSH 5301	Introduction to Computational Statistics
INSH 5302	Information Design and Visual Analytics
MATH 5131	Introduction to Mathematical Methods and Modeling
MATH 7203	Numerical Analysis 1
MATH 7205	Numerical Analysis 2
MATH 7233	Graph Theory
MATH 7241	Probability 1
MATH 7340	Statistics for Bioinformatics
MATH 7341	Probability 2
MATH 7342	Mathematical Statistics
MATH 7344	Regression, ANOVA, and Design
PHSC 6214	Experimental Design and Biostatistics
PHYS 5116	Network Science 1

Program Credit/GPA Requirements

15–16 total semester hours required
Minimum 3.000 GPA required