

Bioinformatics, Graduate Certificate

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 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 6308	Bioinformatics Computational Methods 1	4
BINF 6309	Bioinformatics Computational Methods 2	4

Elective

Code	Title	Hours
Complete one of the following. Electives outside this list may be chosen in consultation with faculty advisor:		3-4

BIOE 5100	Medical Physiology	
BIOE 5235	Biomedical Imaging	
BIOE 5420	Cellular Engineering	
BIOL 5100	Biology Colloquium	
BIOL 5499	Plant Biotechnology	
BIOL 5543	Stem Cells and Regeneration	
BIOL 5549	Microbial Biotechnology	
BIOL 5569	Advanced Microbiology	
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	
BIOL 6399	Dynamics of Microbial Ecology	
BIOL 6407	Biochemistry for Molecular Biologists	
BIOT 5120	Introduction to Biotechnology	
BIOT 5130	Team Skills in Biotechnology	
BIOT 5145	Basic Biotechnology Lab Skills	
BIOT 5219	The Biotechnology Enterprise	

BIOT 5225	Managing and Leading a Biotechnology Company
BIOT 5226	Biotechnology Entrepreneurship
BIOT 5227	Economics and Marketing for Biotechnology Managers
BIOT 5560	Bioprocess Fundamentals
BIOT 5631	Cell Culture Processes for Biopharmaceutical Production
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 5616	Protein Mass Spectrometry
CHEM 5617	Protein Mass Spectrometry Laboratory
CHEM 5620	Protein Chemistry
CHEM 5660	Analytical Biochemistry
CHEM 7317	Analytical Biotechnology
CS 5010	Programming Design Paradigm
CS 5100	Foundations of Artificial Intelligence
CS 5200	Database Management Systems
CS 5400	Principles of Programming Language
CS 5500	Managing Software Development
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
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 7341	Probability 2
MATH 7342	Mathematical Statistics
MATH 7344	Regression, ANOVA, and Design
MATH 7345	Nonparametric Methods in Statistics
PHSC 6214	Experimental Design and Biostatistics
PHYS 5116	Complex Networks and Applications

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PHYS 7331	Network Science Data
PHYS 7332	Network Science Data 2
PPUA 5301	Introduction to Computational Statistics
PPUA 5302	Information Design and Visual Analytics

Note: International students are required to select a 4-credit elective to maintain a full-time status, 8SH.

Program Credit/GPA Requirements

15–16 total semester hours required

Minimum 3.000 GPA required