

Bioinformatics and Cheminformatics, Graduate Certificate

The Certificate in Bioinformatics and Cheminformatics focuses on understanding a diverse set of data from biological systems to chemical informatics (or cheminformatics). Bioinformatics focuses on storing, indexing, searching, retrieving, and applying information about biologic molecules, such as genomics. Cheminformatics focuses on storing, indexing, searching, retrieving, and applying information about chemical compounds.

Program Requirements

The certificate program is comprised of one four-credit course, two three-credit courses, and one elective course.

Code	Title	Hours
Required Courses		
BIOL 6299	Molecular Cell Biology for Biotechnology	3
BINF 6400	Genomics in Bioinformatics	4
CHEM 6500	Cheminformatics	3
Elective		
Complete one of the following:		3-4
BIOE 5235	Biomedical Imaging	
BIOE 5420	Cellular Engineering	
BIOE 6100	Medical Physiology	
BIOL 5543	Stem Cells and Regeneration	
BIOL 5549	Inventions in 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 6300	Biochemistry	
BIOL 6301	Molecular Cell Biology	
BIOL 6303	Neurobiology and Behavior	
BIOL 6407	Biochemistry for Molecular Biologists	
BIOT 5120	Foundations in Biotechnology	
BIOT 5225	Managing and Leading a Biotechnology Company	
BIOT 5226	Biotechnology Entrepreneurship	
BIOT 5227	Launching Your Science: Biotechnology Entrepreneurship	
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 5638	Molecular Modeling	
CHEM 7317	Analytical Biotechnology	

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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
DA 5020	Collecting, Storing, and Retrieving Data
DA 5030	Introduction to Data Mining/Machine Learning
HINF 5101	Introduction to Health Informatics and Health Information Systems
HINF 5102	Data Management in Healthcare
HINF 5105	The American Healthcare System
HINF 5110	Global Health Information Management
HINF 5200	Theoretical Foundations in Personal Health Informatics
HINF 6220	Database Design, Access, Modeling, and Security
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 7341	Probability 2
MATH 7342	Mathematical Statistics
MATH 7344	Regression, ANOVA, and Design
PHYS 7332	Network Science Data 2

Program Credit/GPA Requirements

Minimum 13 semester hours

Minimum 3.000 GPA required