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.

Required Courses	Code	Title	Hours
BINF 6400 Genomics in Bioinformatics	Required Courses		
CHEM 6500 Cheminformatics 3	BIOL 6299	Molecular Cell Biology for Biotechnology	3
Elective Complete one of the following: Biomedical Imaging BIOE 5225 Biomedical Imaging BIOE 5420 Cellular Engineering BIOE 5420 Medical Physiology BIOL 5543 Stern Cells and Regeneration BIOL 5549 Inventions in Microbial Biotechnology BIOL 5559 Advanced Microbiology BIOL 5573 Medical Microbiology BIOL 5581 Biological Imaging BIOL 5581 Biological Imaging BIOL 5585 Evolution BIOL 5587 Comparative Neurobiology BIOL 5587 Comparative Neurobiology BIOL 5597 Immunology BIOL 5599 Advanced Renomics BIOL 5599 Advanced Genomics BIOL 5591 Advanced Genomics BIOL 5591 Advanced Genomics BIOL 5593 Cell and Molecular Biology of Aging BIOL 5593 Cell and Molecular Biology of Aging BIOL 5593 Neurobiology and Behavior BIOL 5301 Molecular Cell Biology BIOL 6303 Neurobiology and Behavior BIOL 5501 Molecular Gell Biology BIOL 5205 Managing and Leading a Biotechnology BIOT 5226 Biotechnology BIOT 5226 Biotechnology Entrepreneurship BIOT 5227 Launching Your Science: Biotechnology Entrepreneurship BIOT 5505 Domestream Processes for Biopharmaceutical Production BIOT 5505 Domestream Processes for Biopharmaceutical Production BIOT 5505 Domestream Processes for Biopharmaceutical Formulations BIOT 5506 Bioprocess Fundamentals BIOT 5505 Domestream Processes for Biopharmaceutical Formulations BIOT 5505 Domestream Processes for Biopharmaceutical Formulations BIOT 5506 Biotechnology Applications in Micecular Biotechnology BIOT 5505 Domestream Processes for Biopharmaceutical Formulations BIOT 5506 Biotechnology Applications in Micecular Biotechnology BIOT 5505 Domestream Processes for Biopharmaceutical Formulations BIOT 5506 Protein Mass Spectrometry CHEM 5500 Introduction to Clycobiology and Glycoprotein Analysis CHEM 5500 Protein Chemistry CHEM 5616 Protein Mass Spectrometry Laboratory CHEM 5620 Protein Chemistry CHEM 5638 Molecular Modeling	BINF 6400	Genomics in Bioinformatics	4
Complete one of the following: BIOE 5235 Biomedical Imaging BIOE 52420 Cellular Engineering BIOE 5100 Medical Physiology BIOL 5543 Stem Cells and Regeneration BIOL 5549 Inventions in Microbiol Biotechnology BIOL 5569 Advanced Microbiology BIOL 5573 Medical Microbiology BIOL 5581 Biological Imaging BIOL 5583 Immunology BIOL 5585 Evolution BIOL 5586 Comparative Neurobiology BIOL 5591 Advanced Genomics BIOL 5591 Advanced Genomics BIOL 5591 Advanced Genomics BIOL 5593 Cell and Molecular Biology of Aging BIOL 5593 Cell and Molecular Biology of Aging BIOL 5593 Cell and Molecular Biology of Aging BIOL 5597 Immunotherapies of Cancer and Infectious Disease BIOL 5300 Biochemistry BIOL 5300 Molecular Cell Biology BIOL 5401 Molecular Biology of Aging BIOL 5401 Molecular Biology Biochemistry BIOL 5402 Biochemistry for Molecular Biologists BIOL 5403 Neurobiology and Behavior BIOL 5405 Biochemistry for Molecular Biologists BIOT 5120 Foundations in Biotechnology BIOT 5225 Managing and Leading a Biotechnology Company BIOT 5226 Biotechnology Entrepreneurship BIOT 5501 Biorecess Fundamentals BIOT 5503 Downstream Processes for Biopharmaceutical Production BIOT 5635 Downstream Processes for Biopharmaceutical Production BIOT 5635 Downstream Processes for Biopharmaceutical Promulations BIOT 5700 Molecular Interactions of Proteins in Biopharmaceutical Formulations BIOT 5810 Cutting-Edge Applications in Molecular Biotechnology BIOT 7245 Biotechnology Applications in Molecular Biotechnology CHEM 5616 Protein Mass Spectrometry CHEM 5616 Protein Mass Spectrometry CHEM 5620 Protein Chemistry CHEM 5620 Protein Chemistry CHEM 5620 Protein Chemistry CHEM 5638 Molecular Modeling	CHEM 6500	Cheminformatics	3
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CHEM 7317 Analytical Biotechnology	CHEM 7317	Analytical Biotechnology	

2 Bioinformatics and Cheminformatics, Graduate Certificate

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