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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 6299</td>
<td>Molecular Cell Biology for Biotechnology</td>
<td>3</td>
</tr>
<tr>
<td>BINF 6400</td>
<td>Genomics in Bioinformatics</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 6500</td>
<td>Cheminformatics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Elective**

Complete one of the following: 3-4

- BIO 5235 Biomedical Imaging
- BIO 5420 Cellular Engineering
- BIO 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 6399 Dynamics of Microbial Ecology
- 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
- 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 7331 Network Science Data
- PHYS 7332 Network Science Data 2
Program Credit/GPA Requirements
Minimum 13 semester hours
Minimum 3.000 GPA required