

Bioinformatics Minor

The goal of the Bioinformatics program is to prepare students to use computers to analyze genomic information, which is revolutionizing our understanding of health and disease.

In humans, a DNA sequence of 3 billion characters in each cell provides a blueprint for producing proteins and other functional molecules. This "language of life" carries our genetic information, often determining whether a cell or organism is healthy or not.

Bioinformatics is an interdisciplinary science that involves the development and use of computational, statistical, and mathematical tools to store and analyze large biological datasets, such as genomic sequences. Bioinformatics is routinely used in genomics research and in personalized medicine. For example, bioinformatics analyses have led to an increased understanding of genetic diseases, such as Parkinson's Disease, and are being used to tailor medical treatments for cancer patients, based on the genomics of the tumor.

Objectives

The Bioinformatics minor will

- introduce students to core concepts in computer programming, genomics, and data analysis
- expose students to current Bioinformatics tools and databases
- train students to apply bioinformatics programming and analytic skills to solve biological problems
- prepare students who want to pursue graduate studies in Bioinformatics or Computational Biology, or for related careers

The minor requires a total of 19-21 credits as follows:

	Course	Credits
Required Courses	CSC 210: Computer Science and Programming I	3
	Either MAT 216: Statistical Data Analysis (3 cr) OR MAT 315: Applied Probability and Statistics (4 cr)	3-4
	BIO 230: Genetics w/ Laboratory OR BIO 304: Genetics and Society AND BIO 314: Genetics and Society Lab	4
	CSC 314: Introduction to Bioinformatics	3
	CSC 315: Bioinformatics Programming and Analysis	3
	Select ONE of the following elective courses ¹	CSC 342: Advanced Database Systems
CSC 305: Data Mining and Applications		3
CSC/MAT 350: Numerical Analysis		3
MAT 373: Explorations - Mathematical Biology		3
BIO 450: Biotechnology with Lab		4
BIO 436: Molecular Genetics with Lab		4
Total Credits		19-21

¹Additional elective courses may count with approval of the Bioinformatics coordinator.