University of Northern Iowa

Department of Computer Science

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Bioinformatics

a **new major**
in the
Department of
Computer Science

University of Northern Iowa

What is bioinformatics?

Bioinformatics is a relatively new profession pairing biology and computer science. It describes the use of computers to analyze, manipulate and store biological information.

Why is bioinformatics important?

Genome sequencing projects have generated vast amounts of DNA sequence information. Biologists are now trying to understand genes, their function and the role they play in the diagnosis and treatment of disease. Bioinformatics is the study of the application of computational methods to the analysis and management of genomic data. It includes the development of methods for searching genomic databases, analyzing DNA sequences and predicting protein structure and function.

Bioinformatics at UNI

The Bachelor of Science in bioinformatics at UNI is one of the first undergraduate programs in bioinformatics in the United States. It is designed for students with interests in computer science, biology, chemistry and mathematics. The program provides formal training in the development and use of bioinformatics methods to solve problems in molecular biology.

The bioinformatics program at UNI seeks to prepare students to analyze and manipulate genomic databases through an understanding of the tools and techniques of computer science, mathematics and biology. The program will prepare students for either graduate school or a career in the rapidly growing biotechnology industry.

For more information visit www.cs.uni.edu.

Career opportunities in bioinformatics

Individuals with the skills to work on the interface between computer science and molecular biology are in high demand in biotechnology, healthcare and pharmaceutical industries, government and universities. According to the U.S. Bureau of Labor Statistics, "bioinformatics specialist" is one of the top 30 new and emerging occupations.

"Career opportunities in bioinformatics are very, very good," said John M. Greene, senior staff scientist, bioinformatics research, at Gene Logic, Inc., Gaithersburg, Maryland. "It seems that every time you turn around a company has decided to set up a bioinformatics group, or expand an existing group. Many scientists are turning their careers in this direction..."

> *Science Magazine:* Focus on Careers: Bioinformatics Science

Coursework

Mathematics

Calculus I and II
Elementary Probability and Statistics for Bioinformatics
Introduction to Probability
Statistical Methods in Bioinformatics

Computer Science

Computer Science I and II
Computing for Bioinformatics I and II
Discrete Structures
Database Systems
Information Storage and Retrieval
Undergraduate Research in Computer Science (1 hour)

Biology

General Biology: Organismal Diversity
General Biology: Cell Structure and Function
Molecular Biology of the Cell
Genetics
Recombinant DNA Techniques

Chemistry

General Chemistry I-II or or both
General Chemistry I and General Chemistry II
Applied Organic and Biochemistry

Elective

Three hours