

NJITTM

New Jersey's Science &
Technology University

THE EDGE IN KNOWLEDGE

The Master of Science in Bioinformatics



Department of Computer Science
College of Computing Sciences

New Jersey Institute of Technology

WHY PURSUE A MASTER'S IN BIOINFORMATICS?

Bioinformatics is a new and exciting field that stands at the intersection of biology, computer science and information technology. Computation is doing for biology today what the microscope did four centuries ago - allowing scientists to peer deeper into the fundamental processes of life and to extract and to utilize tremendous quantities of bioinformation for medical and other practical purposes. Decoding the human genome, for example, which contains three billion "letters" organized into 25,000 genes, would have been impossible without the contribution of this young field. The next steps toward understanding the human genome and applying this knowledge will also require bioinformatics.

WHY STUDY BIOINFORMATICS AT NJIT?

NJIT is one of the first schools in the region to offer a bioinformatics degree. It has an exceptional concentration of faculty in this field, all active researchers who involve students in their work. As a science and technology university, NJIT also offers many possibilities for combining the study of bioinformatics with study of a related field, such as biomedical engineering or biology. The university works to place bioinformatics students in co-op and internship programs in one of the many biotechnology, pharmaceutical and medical companies in the New York/ New Jersey area.

WHAT DOES THE PROGRAM COVER?

The Master's Degree in Bioinformatics was designed to address the growing need for professionals with an educational background that blends biology with computer science. This combination of skills is needed both in the pharmaceutical and biotechnology industries and in biomedical research. This master's program is designed to provide bioinformatics skills for those with a background in either biology or computer science. Based on the selection of electives, the student can specialize in the life sciences (for a student with a biology background) or computing (for a student with a computer science background).

WHAT WILL YOU LEARN?

Core courses include bioinformatics, datamining, and biostatistics. A wide range of electives are available in biology, computing, chemistry, biomedical engineering and mathematics. Students learn about the design, construction and use of software tools that model living things as well as the most important tools of the trade for computational analysis of biodata. Graduates acquire an in-depth knowledge of biological, genomic and medical databases. Students also learn how to mine data to detect underlying patterns and relationships across the vast web of life.

WHAT ARE THE REQUIREMENTS FOR ADMISSION?

- BS or BA Degree.
- Computer courses in programming & data structures equivalent to CS 113 & CS 114.
- One or more courses in genetics or molecular biology, equivalent to R120:352 Genetics or R120:356 Molecular Biology or BNFO 501 Molecular Biology for CS.
- Mathematics courses equivalent to Math 111 & Math 112 (calculus).

If the prerequisites are not fulfilled, the student is required to complete specific bridge courses.

WHAT COURSES ARE AVAILABLE?

Core Courses:

BNFO601	Foundations of Bioinformatics/ Structural Bioinformatics
BNFO602	Foundations of Bioinformatics/ Comparative Bioinformatics
BNFO615	Data Structures and Algorithms for Bioinformatics
BNFO644	Data Mining and Management in Bioinformatics
BNFO694	Bioinformatics Seminar
MATH 663	Introduction to Biostatistics

WHAT CAREER OPPORTUNITIES EXIST?

An MS in Bioinformatics prepares you to work in a biotechnology, pharmaceutical, medical research or medical institution. New Jersey is home to the largest concentration of pharmaceutical laboratories in the United States, and the New York metropolitan area has the largest number of medical institutions. The NJIT MS in Bioinformatics program serves as preparation for work in industry, career advancement or for further graduate or professional study.

WHAT CAREER TRACKERS SAY ...

Industry's demand for scientists with skills in bioinformatics far exceeds the supply of qualified specialists in the field.

Science Magazine
recruit.sciencemag.org

Because of the need for a background in biology and computer science, bioinformatics specialists can expect to receive salaries that exceed those of individuals in comparable computer careers.

Madison Magazine
madisonmagazine.com

The fusion of biology and computer science is the hottest of the hot in science right now, and it's going to heat up even more.

Smart Money Magazine
smartmoney.com

FOR FURTHER INFORMATION, CONTACT:

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cs.njit.edu/academics/graduate/msbio.php

TO APPLY, CONTACT:

<http://www.njit.edu/admissions/graduate/howtoapply.php>