School of Natural Sciences and Mathematics

Bioinformatics and Computational Biology Program

Master of Science in Bioinformatics and Computational Biology

*36 semester credit hours minimum*

Program Faculty

**Professors:** Larry P. Ammann, M. Ali Hooshyar, Wieslaw Krawcewicz, Susan E. Minkoff, Robert Serfling, Janos Turi, John Zweck

**Associate Professors:** Swati Biswas, Yan Cao

**Assistant Professor:** Min Chen

**Affiliated Faculty:** Zhenyu Xuan, Hyuntae Yoo, Michael Qiwei Zhang

Degree Objectives

The Master of Science in Bioinformatics and Computational Biology (BCBM) is offered jointly by the Departments of Mathematical Sciences and Biological Sciences. This program will combine coursework from the disciplines of biology, computer science, and mathematics. The BCBM program seeks to answer the demand for a new breed of scientist who has fundamental understanding in the fields of biology, mathematics, statistics, and computer science. With this interdisciplinary training, these scientists will be well prepared to meet the demand and challenges that have arisen and will continue to develop in the biotechnology arena.

Faculty from both Mathematical Sciences (MMS) and Biological Sciences will participate in the Bioinformatics and Computational Biology program, with the Mathematical Sciences Department serving as the administrative unit. Both departments will participate in advising students.

For the master's degree in Bioinformatics and Computational Biology, beginning students are expected to have completed multivariate calculus, linear algebra, two semesters of general chemistry, two semester of organic chemistry, two semesters of general physics, programming in C/C++, and two semesters of biology.
Requirements for completing a degree in BCBM are:

Core Courses
- **BIOL 5410** Biochemistry
- **BIOL 5420** Molecular Biology
- **BIOL 5381** Genomics
- **STAT 5351** Probability and Statistics I
- **STAT 5352** Probability and Statistics II
- **MATH 6341** Bioinformatics

Additional Core Courses for the Computational Biology Track
- **MATH 6313** Numerical Analysis
- **MATH 6343** Computational Biology
- **MATH 6345** Mathematical Methods in Medicine and Biology

Additional Core Courses for the Bioinformatics Track
- **CS 5333** Discrete Structures
- **CS 5343** Algorithms Analysis and Data Structures
- **CS 6360** Database Design

Elective Courses
A minimum of 7 semester credit hours of electives, approved by the student's advisor. Typically, electives are 6000- and 7000-level courses in mathematical sciences, biology or computer science. Courses from other disciplines may also be used upon approval.

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