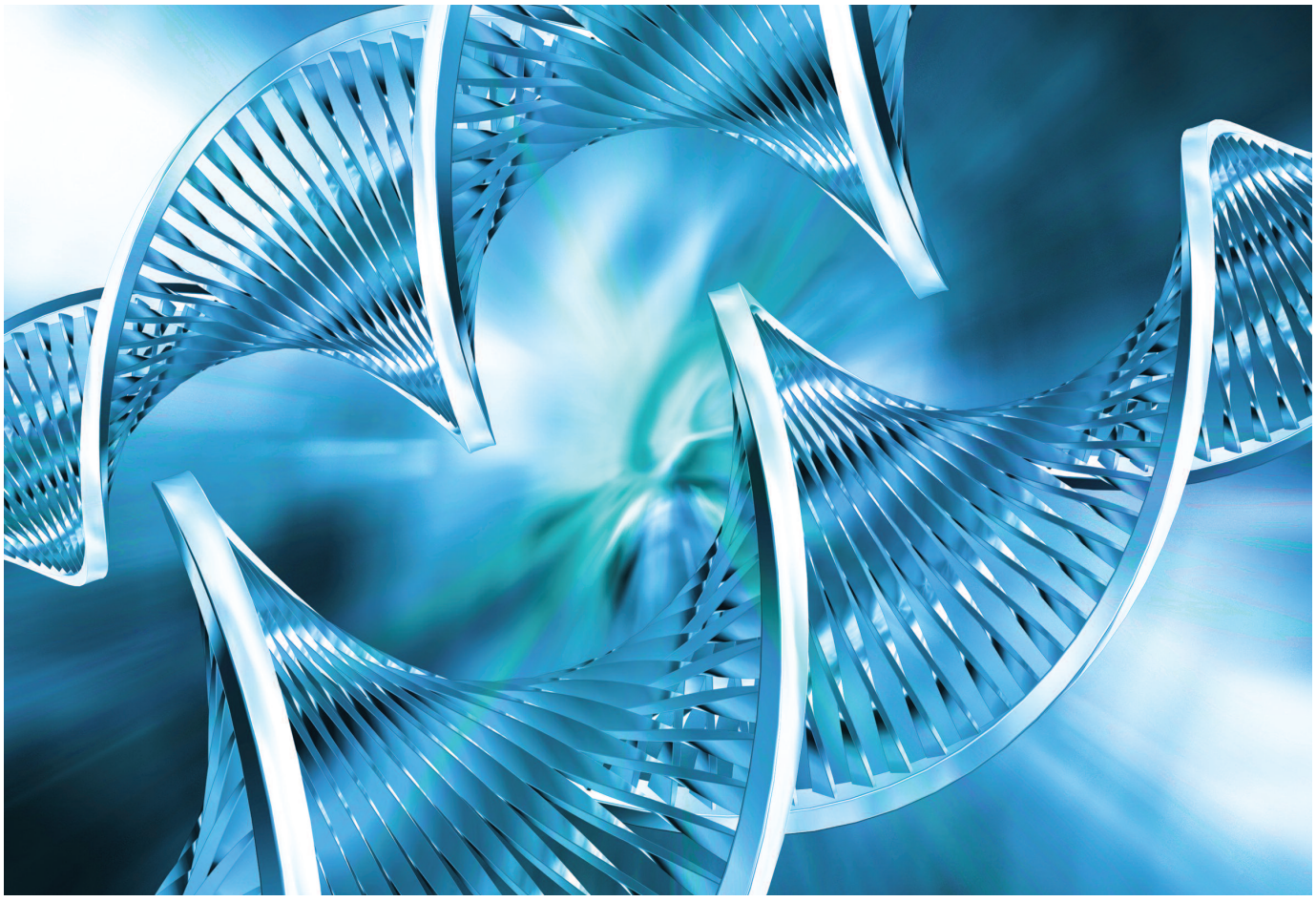
NJIT
New Jersey's Science & Technology University

THE EDGE IN KNOWLEDGE

# The Master of Science Program in Computational Biology



Department of Mathematical Sciences

College of Science and Liberal Arts

**New Jersey Institute of Technology**

## WHY STUDY COMPUTATIONAL BIOLOGY?

In recent years there has been an explosion of interest in the Life Sciences. In particular, mathematicians, physicists, and computer scientists have been adapting their skills to the study of biological problems. They have utilized their theoretical training to develop and apply techniques that address and solve problems related to, for example, the genome, developmental biology, neuroscience, and ecology. Many of these techniques involve harnessing the vast computational power that is now available to develop and solve mathematical models that successfully predict biological phenomena. The skills needed to do this are in heavy demand in industry as well as in academe and government labs.

## WHY STUDY COMPUTATIONAL BIOLOGY AT NJIT?

The Master's in Computational Biology is a program of NJIT's Department of Mathematical Sciences, which is nationally recognized for high-quality education and its applied research programs. Active participation in the MS program by more than 40 NJIT mathematical sciences faculty produces a stimulating learning environment. The department's 20 active research projects have more than $2 million in funding from public and private sources, including NSF, NIH, NASA, the US Department of Energy, the Air Force Office of Science and Research, and Novartis. Many of the program faculty have earned international reputations as a result of the breadth and depth of their accomplishments.

### WHO SHOULD ENROLL?

The Master of Science in Computational Biology seeks to train students at the interface of biology, computational science, and mathematical science. The program will train students to put biological problems in mathematical form using the techniques of mathematical modeling. It will teach students how to use computational, numerical, and analytical tools to analyze and solve mathematical models, and how to interpret the results in biological terms. The program will be of interest to students who want to pursue a truly inter-disciplinary learning experience.

### IS FINANCIAL AID AVAILABLE?

Financial support (for full-time students) in the MS program is extremely limited. Full-time domestic and international students may be eligible to receive the Provost Fellowship. For further information on financial aid, visit www.njit.edu/graduatestudies/finaid.php.

### PROGRAM SUMMARY

Degree Awarded: Master of Science in Computational Biology
Credits required: 30 (ten 3 credit hour courses).
Program Objective: To train students in mathematical methods needed to study biological problems, in order to prepare them for a range of professional opportunities in industry and academia that focus on computations.

### ADMISSION REQUIREMENTS

Bachelor's degree in Mathematics, Applied Mathematics, or other mathematically oriented discipline such as Physics, Engineering, Biology, or Chemistry. In particular, the following courses are required: an undergraduate course in ordinary differential equations and linear algebra; one year of physics, one semester of chemistry, biology, and computer programming.

1. GPA of at least 2.8 on a 4.0 scale is required. GRE is required for (i) all applicants seeking financial support and (ii) all applicants whose most recent degree is from an institution outside the U.S. For such applicants, a currently valid GRE score must be submitted directly from ETS to the NJIT Graduate Admissions office. For all others, GRE scores are encouraged but not required.
2. For international applicants who have not been a student in a U.S. educational institution: either a TOEFL score (minimum eligible score 79), or an IELTS score (minimum eligible score 6.5, with no sub-score below 6.0) is also required.
3. If the prerequisites are not fulfilled, completion of specific bridge courses will be required as a condition of admission.

### CURRICULUM

The MS degree program in Computational Biology consists of seven core (i.e., required) courses plus three elective courses, for a total of 30 credits. For complete degree requirements consult the graduate catalog.

### CORE COURSES (21 CREDIT HOURS)

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| Math 611 | Numerical Methods |
| Math 630 | Linear Algebra |
| Math 635 | Analytic and Computational Neuroscience |
| Math 663 | Introduction to Biostatistics |
| Biol 601 | Computational Biology I |
| Biol 638 | Computational Ecology |
| Bnfo 601 | Bioinformatics I |

### ELECTIVE COURSES (9 CREDIT HOURS)

Consult the on-line graduate catalog and course schedules for courses available in any given semester. The three elective courses are selected with approval of the Graduate Advisor. A project (or thesis) is optional.

### FOR FURTHER INFORMATION, CONTACT:

Graduate Programs, Department of Mathematical Sciences
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http://math.njit.edu

### TO APPLY, CONTACT

Office of Graduate Admissions
(973)596-3300, or apply on-line at
www.njit.edu/admissions/apply-online.php