

# The Doctor of Philosophy Program in Mathematical Sciences



Department of Mathematical Sciences

College of Science and Liberal Arts

**New Jersey Institute of Technology**

## WHY STUDY FOR A DOCTORATE IN THE MATHEMATICAL SCIENCES?

Mathematical scientists play increasingly important roles as advances in research use and benefit from quantitative mathematical models. Successful analysis of complex models illuminates the role and interaction of key components in the system being studied and provides essential tools for evaluating and improving system performance. The sequence of model development, analysis, simulation and interpretation of data demands application of advanced mathematical methods at a level that often requires the knowledge and skills acquired during doctoral study.

## WHY STUDY MATHEMATICAL SCIENCES AT NJIT?

NJIT's doctoral program has more than 40 active faculty, supported by state-of-the-art computer facilities, with research interests across many areas of applied mathematics and statistics. Many of the faculty have earned international reputations as a result of the breadth and depth of their accomplishments. Through activities, such as a regular colloquium series and seminars, students are exposed to the latest innovations in the mathematical sciences. The environment is uniquely suited for students setting out on a research career.

### WHAT RESEARCH SPECIALIZATIONS ARE REPRESENTED?

*Applied Mathematics* - Mathematical modeling, asymptotic methods, and scientific computing are emphasized. Specific areas of application include: Acoustics, Dynamical Systems, Electromagnetics, Fluid Mechanics and Combustion, Materials Science, Mathematical Biology and Neuroscience, Phylogenetic Reconstruction, and Wave Propagation.

*Applied Probability and Statistics* - Applied Probability and Stochastic Modeling, Nonparametric Statistics and Statistical Inference, Reliability Theory and Applications, and Time Series Analysis and Forecasting.

### WHO SHOULD ENROLL?

The program is intended for highly motivated and able students with a strong interest in mathematics and its applications, who are interested in the challenges of research and a career in the mathematical sciences or a related field.

The degree can be completed on a part-time basis, but participation on a full-time basis is strongly encouraged.

### IS FINANCIAL AID AVAILABLE?

Various financial support and award options are available to students who enroll for full-time study in the PhD program. These include university fellowships, teaching assistantships, and government and industry sponsored research assistantships. For further information on financial aid, visit <https://www.njit.edu/financialaid/graduate/financial-support.php>

### PROGRAM SUMMARY.

Degree Awarded: PhD in Mathematical Sciences

The time taken to complete the PhD degree from entry with a bachelor's degree is usually four to five years.

Program Objective: To prepare students for advanced independent research in the mathematical sciences that is directed to the solution of modern scientific, technological, and industrial problems.

### ADMISSIONS REQUIREMENTS:

Bachelor's or master's degree in Mathematics or other mathematically oriented discipline such as Physics, Engineering, or Chemistry.

GPA from prior study of at least 3.5 on a 4.0 scale required.

GRE scores are not required. International students from non-English speaking countries who do not have a degree from a U.S. university must pass TOEFL, IELTS, or Duolingo exams; see <https://www.njit.edu/admissions/graduate-faq>

### RECENTLY-RUN ADVANCED GRADUATE COURSES

#### Applied and Computational Math & Mathematical Biology

Analytical and Computational Neuroscience

Asymptotics

Biological Waves and Oscillations

Computational Fluid Dynamics

Financial Mathematics

Mathematical Fluid Dynamics I and II

Foundations of Mathematical Biology

High Performance Computing

Inverse Problems and Global Optimization

Mathematical Modeling

Numerical Linear Algebra

Optimal Transport

Ordinary Differential Equations

Partial Differential Equations

Pattern Formation in Biological Systems

Scientific Computation

Stochastic Differential Equations

Systems Computational Neuroscience

#### Applied Probability & Statistics

Biostatistics

Design and Analysis of Experiments

Probability Theory

Sampling Theory

Statistical Inference

Statistical Theory of Reliability

Time Series Analysis

### FOR FURTHER INFORMATION, CONTACT:

Associate Chair For Graduate Studies

Roy Goodman, [goodman@njit.edu](mailto:goodman@njit.edu)

or visit <http://math.njit.edu>

### TO APPLY, CONTACT:

Office of Graduate Admissions, (973) 596-3300, or apply on-line at

<http://www.njit.edu/apply-now>