GRADUATE STUDY

# MATHEMATICAL SCIENCES

WORCESTER POLYTECHNIC INSTITUTE · LEHR UND KUNST · 1865
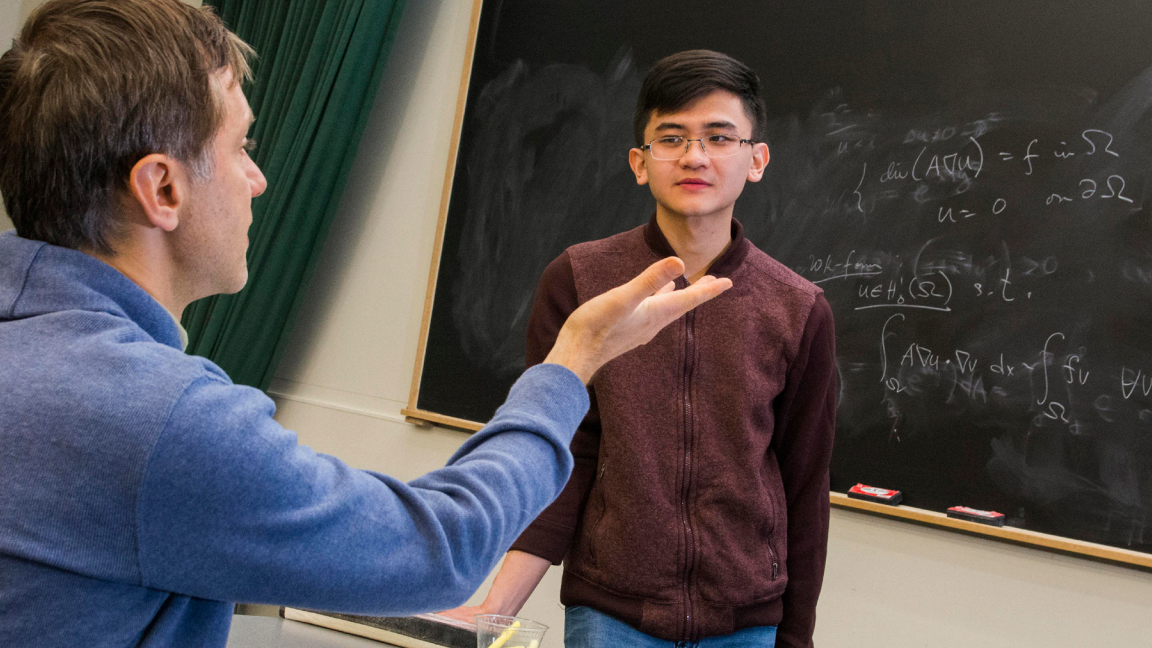
# WPI

## ABOUT OUR PROGRAM

WPI's Department of Mathematical Sciences offers varied and comprehensive graduate programs, from applied master's degree programs to our flagship PhD program. Students in the master's degree programs will be prepared for employment in areas requiring advanced mathematics such as cybersecurity, bioengineering, business, or finance, as well as for higher education in their field. Students in the PhD program work on research projects with faculty, many of whom are internationally recognized leaders in their fields.

With a wide breadth of research directions, ranging from pure mathematics questions in algebra, analysis, and geometry, to the development of new mathematics underlying problems in science and engineering, to the creation of computational models with immediate impact in other fields, students may develop a precise program of study to suit their interests. In particular, the department has expanded its research and educational activities via two joint programs: Data Science and Bioinformatics & Computational Biology, where the statistics group is a core contributor.

Students work one-on-one with faculty members and cultivate broad networks to develop valuable global industry and academic connections. The department's influential research is evidenced by the large number of grants and awards from the National Science Foundation, the National Institutes of Health, the National Security Agency, the Air Force Office of Scientific Research, and industry partners. In particular, many of our grants support PhD students with Research Assistantship opportunities.

**For more information, visit wpi.edu/+math or contact us at 508-831-5241 or ma-radegrees@wpi.edu.**

## DEGREES OFFERED

**Master of Science Programs**

Master of Science in
Applied Mathematics

Master of Science in
Applied Statistics

Professional Master of Science in
Financial Mathematics

Professional Master of Science in
Industrial Mathematics

**Master's Programs for Educators**

Master of Mathematics for Educators

Master of Science in
Mathematics for Educators

**Doctoral Programs in
Mathematical Sciences**

Doctor of Philosophy in
Mathematical Sciences

Doctor of Philosophy in Statistics

## JOIN A VIBRANT RESEARCH COMMUNITY

When you pursue a MS or PhD degree in mathematical sciences at WPI, you join a vibrant community of internationally recognized researchers and educators including faculty, postdoctoral scholars, and students. WPI's multidisciplinary culture offers exciting possibilities for mathematicians and statisticians to collaborate with scientists and engineers across disciplines on fundamental and applied research.

Our faculty and students are currently involved in diverse, jointly designed projects with colleagues in computer science, physics, engineering, and the life sciences. Students may also conduct project work and internships through the Center for Industrial Mathematics and Statistics (CIMS), a center within the Mathematical Sciences Department that fosters partnerships with industry, business, and government agencies in mathematics and statistics research.

# RESEARCH AREAS

**Algebra/Discrete Mathematics**

Discrete geometry

Graph theory and combinatorics

**Analysis**

Calculus of variations

Numerical analysis

Partial differential equations

Probability and stochastic analysis

**Applied Mathematics**

Computational fluid dynamics

Computational modeling

Cryptography

Financial mathematics

Inverse problems

Mathematical biology

Mathematics of materials science

**Statistics**

Bayesian statistics

Biostatistics and bioinformatics

Compressed sensing

Financial time series

High-dimensional statistical learning
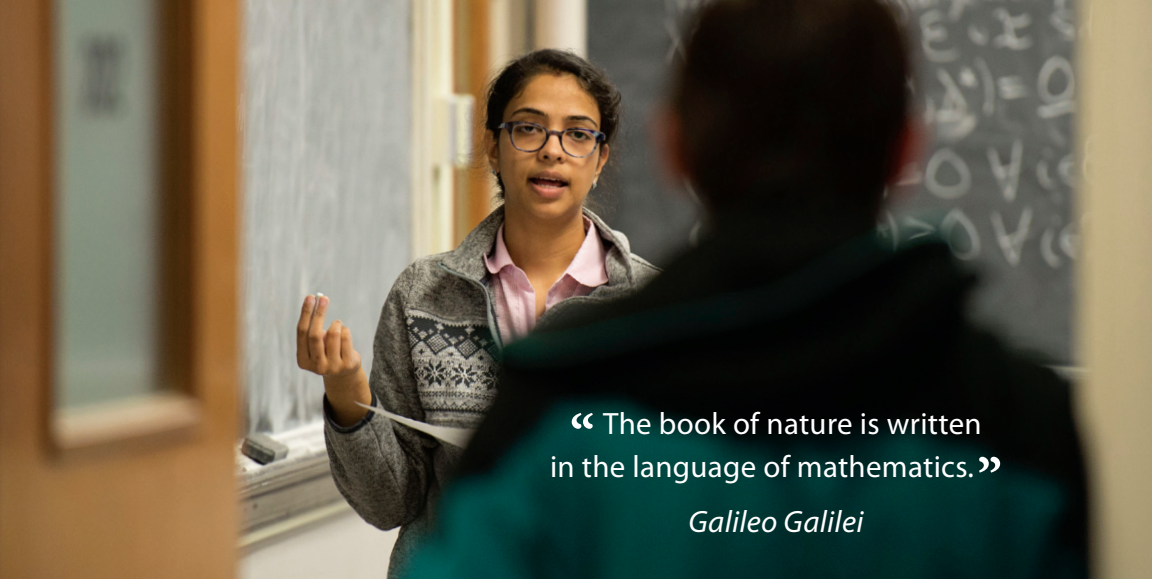
Small area estimation

# COMPUTING FACILITIES

Students in the Mathematical Sciences Department have access to its state-of-the-art Turing cluster that was acquired through a National Science Foundation grant. It features 480 Intel Xeon E-5 2680v2 2.8GHz CPUs and 48 Nvidia K20 GPUs, each one with peak double-precision floating point performance of 1.17 TFLOPS. The department also has an Ace cluster with eight computer nodes configured with two 2.8GHz Intel Xeon E5-2680 CPUs: 10 cores each/20 cores total.

**IN THE HEART OF NEW ENGLAND.** WPI's beautiful 95-acre campus is located in a charming residential area of Worcester, Massachusetts. Affordable and accessible—less than an hour to Boston and 3.5 hours to New York—Worcester is home to more than a dozen colleges and universities and offers the plentiful and diverse cultural and social amenities of a great college town. In the heart of the New England technology corridor, WPI's location offers rich opportunities for collaborative research and rewarding careers.

## ABOUT WPI

Worcester Polytechnic Institute, one of the nation's premier science- and engineering-focused universities, was founded in 1865 with the mission of providing an education that balances theory and practice. A dynamic and welcoming graduate community, world-renowned faculty mentors, a culture of collaboration, spectacular research facilities, and close relationships with industry make WPI an outstanding environment for aspiring scientists, engineers, innovators, and entrepreneurs. Here, you will pursue cutting-edge, multidisciplinary research and contribute to breakthroughs that deepen our understanding of the world, engender new lines of inquiry, and meet the technological challenges facing the world today.

> « The book of nature is written in the language of mathematics. »
>
> *Galileo Galilei*

## BEYOND WPI

Whatever path students choose, a solid background in mathematical sciences allows them to contribute creatively to some of the most critical challenges facing the world today. Our PhD students have an excellent record of success in seeking postgraduation academic positions. They have accepted postdoctoral and tenure-track positions at academic institutions, including these:

UCLA

Courant Institute/NYU

Johns Hopkins University

Rutgers University

University of Utah

Graduates of our MS degree programs launch into myriad corporate careers in the financial, IT, and biomedical industries with influential employers, including these:

Boeing

Fidelity Investments

MathWorks

Microsoft

**wpi.edu/+math**