DEPARTMENT OF MATHEMATICS, APPLIED MATHEMATICS, AND STATISTICS

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The Department of Mathematics, Applied Mathematics, and Statistics at Case Western Reserve University is an active center for mathematical and statistical research. Faculty members conduct research in algebra, analysis, applied mathematics, convexity, dynamical systems, geometry, imaging, inverse problems, life sciences applications, mathematical biology, modeling, numerical analysis, probability, scientific computing, statistics, stochastic systems, and other areas.

The department offers a variety of programs leading to both undergraduate and graduate degrees in traditional and applied mathematics and statistics. Undergraduate degrees are Bachelor of Arts or Bachelor of Science in mathematics, Bachelor of Science in applied mathematics, and Bachelor of Arts or Bachelor of Science in statistics. Graduate degrees are Master of Science and Doctor of Philosophy. Integrated BS/MS programs allow a student to earn a Bachelor of Science in either mathematics or applied mathematics and a Master of Science in this department or another department in five years; there is a similar integrated bachelor's/master's degree program in statistics. The department, in cooperation with the college's Teacher Licensure Program, offers a course of study for individuals interested in pre-college teaching. Together with the Department of Physics, it offers a specialized joint Bachelor of Science in Mathematics and Physics.

Mathematics plays a central role in the physical, biological, economic, and social sciences. Because of this, individuals with degrees in mathematics enjoy excellent employment prospects and career opportunities. A bachelor's degree in mathematics or applied mathematics provides a strong background for graduate school in many areas (including computer science, medicine, and law, in addition to mathematics and science) or for a position in the private sector. A master's degree in mathematics or applied mathematics, or an undergraduate degree in applied mathematics combined with a master's in a different area, is an excellent basis for private-sector employment in a technical field. A PhD degree is usually necessary for college teaching and research.

Statistics links mathematics to other disciplines in order to understand uncertainty and probability, both in the abstract and in the context of actual applications to science, medicine, actuarial science, social science, management science, business, engineering, and contemporary life. As technology brings advances, the statistical theory and methodology required to do them justice becomes more challenging: higher-dimensional, dynamic, or computer-intensive. The field of statistics is rapidly expanding to meet the three facets of these challenges: the underlying mathematical theory, data analysis, and modeling methodology, and interdisciplinary collaborations and new fields of application.

Students in the department, both undergraduate and graduate, have opportunities to interact personally with faculty and other students, participate in research, and engage in other activities. In addition, undergraduates can obtain teaching experience through the department's supplemental instruction program.

Department Faculty

Weihong Guo, PhD
(University of Florida)
Professor and Chair
Imaging and inverse problems; numerical analysis and scientific computing

Jenny Brynjarsdóttir, PhD
(The Ohio State University)
Associate Professor
Bayesian statistics; spatial statistics; uncertainty quantification

Christopher Butler, MS
(Case Western Reserve University)
Senior Instructor and Theodore M. Focke Professorial Fellow
Teaching of mathematics

Daniela Calvetti, PhD
(University of North Carolina)
James Wood Williamson Professor
Imaging and inverse problems; numerical analysis and scientific computing; uncertainty quantification

Julia Dobrosotskaya, PhD
(University of California, Los Angeles)
Associate Professor
Analysis and applied analysis; imaging and inverse problems; numerical analysis and scientific computing

David Gurarie, PhD
(Hebrew University, Jerusalem, Israel)
Professor
Continuum and fluid mechanics; dynamical systems; life sciences and biomedical research

Nick Gurski, PhD
(University of Chicago)
Associate Professor
Algebra; category theory, algebraic topology

Mary Ann Horn, PhD
(University of Virginia)
Professor
Analysis and applied analysis; control theory; dynamical systems; life sciences/biomedical research

Steven H. Izen, PhD
(Massachusetts Institute of Technology)
Professor
Imaging and inverse problems; numerical analysis and scientific computing

Joel Langer, PhD
(University of California, Santa Cruz)
Professor and Theodore M. Focke Professorial Fellow
Convex and differential geometry

Mark Meckes, PhD
(Case Western Reserve University)
Professor
High dimensional phenomena, random matrix theory, geometry of metric spaces

Anirban Mondal, PhD
(Texas A&M University)
Associate Professor
Bayesian statistics; spatial statistics; uncertainty quantification

David A. Singer, PhD
(University of Pennsylvania)
Professor
Differential and Algebraic Geometry, Dynamical Systems, Variational Problems

Erkki Somersalo, PhD
(University of Helsinki)
Professor
Imaging and inverse problems; life sciences and biomedical research; uncertainty quantification

Wanda Strychalski, PhD
(University of North Carolina at Chapel Hill)
Associate Professor
Life sciences and biomedical research; continuum and fluid mechanics; numerical analysis and scientific computing

Stanislaw J. Szarek, PhD
(Mathematical Institute, Polish Academy of Science)
Kerr Professor of Mathematics
Analysis and applied analysis; convex and differential geometry; mathematical physics

Peter Thomas, PhD
(University of Chicago)
Professor
Mathematical biology; computational neuroscience; applications of dynamical systems, stochastic processes, information and control theory in the life sciences

Elisabeth Werner, PhD
(Université Pierre et Marie Curie, Paris VI)
Professor
Analysis and applied analysis; convex and differential geometry; probability and stochastic processes

Patricia Williamson, PhD
(Bowling Green State University)
Senior Instructor
Bayesian statistics

Longhua Zhao, PhD
(The University of North Carolina at Chapel Hill)
Associate Professor
Continuum and fluid mechanics; life sciences and biomedical research; numerical analysis and scientific computing

Secondary Faculty

Colin McLarty, PhD
(Case Western Reserve University)
Truman P. Handy Professor of Philosophy, Department of Philosophy
Logic; philosophy of mathematics, history of mathematics

Adjunct Faculty

Carsten Schütt, PhD
(Christian-Albrecht Universität, Kiel)
Adjunct Professor
Convex geometry; Banach space theory; functional analysis

Lecturers

Teresa Contenza
Full-time Lecturer

Paula Fitzgibbon
Full-time Lecturer

Danhong Song
Full-time Lecturer

Emeritus Faculty

Alejandro de Acosta
(University of California, Berkeley)
Professor Emeritus

Michael Hurley
(Northwestern University)
Professor Emeritus

Dong Hoon Lee
(Tulane University)
Professor Emeritus

Marshall Leitman
(Brown University)
Professor Emeritus

Arthur Obrock
(Washington University)
Associate Professor Emeritus

Joseph Sedransk
(Harvard University)
Professor Emeritus

Programs

- Applied Mathematics, BS
- Applied Mathematics, MS
- Applied Mathematics, PhD
- Mathematics and Physics, BS
- Mathematics, BA

- Mathematics, BS
- Mathematics, Minor
- Mathematics, MS
- Mathematics, PhD
- Statistics, BA
- Statistics, BS
- Statistics, Minor
- Statistics, MS

Dual Degrees

- Undergraduate Programs toward Graduate or Professional Degrees