Graduate Studies in

MATHEMATICS

West Virginia University.
EBERLY COLLEGE OF ARTS AND SCIENCES

Programs

MS in Mathematics: Consists of two years of graduate level coursework and has Pure Mathematics and Applied Mathematics tracks.

PhD in Mathematics: Assumes a master's level background in Mathematics and involves an additional three years of coursework and research experience.

Students are admitted into the MS or PhD program depending on their background. Students with a BS level background committed to pursuing a PhD should enter the Pure Mathematics MS track and can transition seamlessly into the PhD program.

Application Deadlines

Spring Semester: October 15
Fall Semester: January 15

Application Checklist

- Graduate application:
  graduateadmissions.wvu.edu/how-to-apply
- Transcripts
- Three letters of recommendation
- Statement of purpose
- English proficiency requirement score (international students only)

GRE score not required

Funding

Students committed to pursuing a PhD are typically supported throughout their studies through Graduate Assistantships. In addition to a stipend, the support package includes a tuition waiver and personal health insurance paid by the University.

Scan the QR code below for more information on our graduate program and the upcoming virtual open house schedule.

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Graduate Studies in

MATHEMATICS

WestVirginiaUniversity.
SCHOOL OF MATHEMATICAL AND DATA SCIENCES

Faculty and Research

Whether searching for solutions to real-world problems or constructing theories necessary to tackle such problems quantitatively and qualitatively, successful mathematicians require rigorous training in a nurturing and high-quality academic environment. Our program offers opportunities for research in various areas of pure mathematics, applied mathematics, mathematics education, and statistics.

Algebra: At WVU, our research is in commutative algebra and higher (or derived) algebra. Commutative algebra forms the foundation of algebraic geometry and finds applications in various areas including algebraic number theory, combinatorics, and homotopy theory. The subject of higher (or derived) algebra is a blend of ideas from algebraic topology with methods of category theory and classical algebra. It has connections with quantum field theory, algebraic and arithmetic geometry. We use techniques of homological algebra, representation theory, higher (or derived) algebra to study both commutative and derived rings along with their modules, and algebraic K-theory.
Faculty: Ela Celikbas, Olgur Celikbas, Dylan Wilson

Applied and Classical Analysis: Applied analysis group studies different physical phenomena using equations and analysis tools. These models are usually from Fluid Dynamics, Finance, Biology, Optimal Transport, Celestial Mechanics, and other areas with direct applications to essential industries. We also have active research in classical real analysis.
Faculty: Harumi Hattori, Harry Gingold, Dening Li, Casian Pantea, Charis Tsikkou, Adrian Tudorascu, Qingtian Zhang

Applied Mathematics: Applied Mathematics is concerned with understanding the world through mathematical models and computation. Research areas include the study of complicated chemical reaction networks, through modeling and simulation, and through theory that combines differential equations and graph theory; celestial mechanics, the study of motion of large bodies over large distances and long times; partial differential equations arising from physical models involving atmospheric flows and flows with mixed phases; and algorithms and machine learning.
Faculty: Marjorie Darrah, Harvey Diamond, Harry Gingold, Adam Halasz, Casian Pantea

Combinatorics and Graph Theory: Combinatorics and graph theory are increasingly important areas of mathematics with many deep questions and surprising applications. Why must large systems contain highly ordered parts? How can we use randomness to advance our understanding of non-random objects? What kinds of structure in a graph (or network) allow problems to be solved efficiently? In all areas of mathematics, you can meet problems that lead to questions involving infinite combinatorial structures.
Faculty: John Goldwasser, Guangming Jing, Hong-Jian Lai, Rong Luo, Kevin Milans, Jerzy Wojciechowski, Cun-Quan Zhang

Research in Undergraduate Mathematics Education (RUME): The RUME program at WVU offers a Ph.D. in Mathematics with research focused on undergraduate mathematics education. The current faculty in this area study the teaching and learning of various topics in mathematics (e.g. proofs, definite integrals, etc.), active learning in classes, and ways to increase success of all students in mathematics, and especially underrepresented students.
Faculty: Marjorie Darrah, Jessica Deshler, David Miller, Laura Pyzdrowski, Vicki Sealey

Set Theory and Topology: Set theory provides fundamental theoretical structures for other areas of mathematics and general topology is a bridge joining set theory with applied mathematics. This area includes infinite combinatorics, convergence theory and set theoretic topology and analysis. Topology is the qualitative study of shapes, such as curves, surfaces, and higher dimensional manifolds. The subjects of algebraic and differential topology have connections and applications to physics, algebraic geometry, arithmetic geometry, and data sciences.
Faculty: Krzysztof Ciesielski, Dylan Wilson, Jerzy Wojciechowski

Statistics: Statistics is the science of modeling data arising in many fields, including those in the social, biological, health, physical, and engineering sciences. Faculty research areas include Experimental Design, Functional Data Analysis, Hausdorff and Stieltjes Moment Problems, Non-Gaussian Linear Models, Statistical Inverse Problems, Statistical Machine Learning, Statistical Signal Processing and Image Reconstructions via Moments.
Faculty: Mihyun Kim, Robert Mnatsakanov, Jason Palmer, Kenneth Ryan

In addition to these research areas, the Mathematics program is part of the SMDS, which houses faculty with research in Data Science. Mathematics graduate students may take courses with and work on research projects led by faculty from the Data Science unit, as well.

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