Mathematics, B.S.

Degrees Offered

- Bachelor of Science

Nature of the Program

The School of Mathematical and Data Sciences provides a curriculum for:

- Students wishing to earn an undergraduate major in mathematics or minors in actuarial science, applied mathematics, and pure mathematics
- Students interested in the applications of mathematics to the fields of computer science, statistics, engineering, physical, natural and social science, and business and economics
- Non-science majors, to educate them in the ideals and objectives of mathematics, fostering quantitative reasoning and problem-solving skills

Minors

All students have the possibility of earning one or more minors; view a list of all available minors and their requirements (http://catalog.wvu.edu/undergraduate/minors/) here. Please note that students may not earn a minor in their major field. An undergraduate student majoring in mathematics may choose to minor in actuarial science, statistics or data science.

Mathematics Learning Center

The Mathematics Learning Center (https://mathanddata.wvu.edu/academic-support/math-learning-center-tutors/) (MLC) is a free walk-in tutoring center open 5-days a week that employs students who are proficient in mathematics. It is located at ARM 301, and the hours are posted on the door or on the School of Mathematical and Data Sciences' webpage. The MLC tutors help with all undergraduate Mathematics courses through Calculus, except MATH 124 and MATH 150. Students in these courses can receive help at the STEM Learning Center (https://stemcollab.wvu.edu/stem-learning-center/).   The MLC also employs students who are proficient in Mathematics. For more information about the center, call (304)293-2011 or contact Dr. Renee LaRue at reneelarue@math.wvu.edu.

FACULTY

DIRECTOR OF THE SCHOOL OF MATHEMATICAL AND DATA SCIENCES

- Jessica Deshler - Ph.D. (University of New Mexico)
  Regular Graduate Faculty, Undergraduate Mathematics Education, Graduate Student Development

ASSOCIATE DIRECTOR OF THE INSTITUTE OF MATH LEARNING

- Lori Ogden - Ph.D. (West Virginia University)
  Associate Graduate Faculty, Undergraduate Mathematics Education

ASSOCIATE DIRECTOR FOR GRADUATE PROGRAMS

- Kevin Milans - Ph.D. (University of Illinois)
  Regular Graduate Faculty, Combinatorics, Graph Theory, and Partially Ordered Sets

ASSOCIATE DIRECTOR FOR UNDERGRADUATE PROGRAMS

- Charis Tsikkou - Ph.D. (Brown University)
  Regular Graduate Faculty, Hyperbolic and Mixed Type Partial Differential Equations, Conservation Laws

ASSOCIATE DIRECTOR OF THE SCHOOL OF MATHEMATICAL AND DATA SCIENCES

- Adrian Tudorascu - Ph.D. (Carnegie Mellon University)
  Regular Graduate Faculty, Partial Differential Equations, Optimal Transport

PROFESSORS

- Krzysztof Ciesielski - Ph.D. (Warsaw University)
  Regular Graduate Faculty, Analysis, Topology, Set theory, MRI imaging
- Marjorie Darrah - Ph.D. (West Virginia University)
  Regular Graduate Faculty, Applied Mathematics, Mathematics Education
- Jessica Deshler - Ph.D. (University of New Mexico)
  Regular Graduate Faculty, Undergraduate Mathematics Education, Graduate Student Development
- Harvey Diamond - Ph.D. (Massachusetts Institute of Technology)

Regular Graduate Faculty, Approximation theory, Applied mathematics

- Harry Gingold - D.Sc. (Israel Institute of Technology)
  Regular Graduate Faculty, Discrete Finite Difference systems of Equations, Factorization of Power Series, Foundation (Geometry), Mathematical Cryptography, Optimization, Compactification, Ordinary Differential Systems of Equations, Asymptotics, Approximations, Turning point theory, Celestial Mechanics
- Erin Goodykoontz - Ed.D. (West Virginia University)
  Introductory Concepts of Mathematics
- Ádám M. Halász - Ph.D. (State University of New York at Stony Brook)
  Regular Graduate Faculty, Molecular systems biology, Monte Carlo methods, Mathematical Physics
- Rong Luo - Ph.D. (West Virginia University)
  Regular Graduate Faculty, Graph Theory, Discrete Math
- David Miller - Ph.D. (Oklahoma State University)
  Regular Graduate Faculty, Undergraduate Math Education, Cognitive Science, STEM Education
- Robert Mnatsakanov - Ph.D. (Moscow Institute of Electronics and Mathematics)
  Regular Graduate Faculty, Applied probability, Approximation of functions from moments, Risk models
- Laura Pyzdrowski - Ed.D. (West Virginia University)
  Regular Graduate Faculty, Undergraduate Math Education, STEM Education, K-12 Outreach, Distance Learning, Instructional Technology
- Kenneth Ryan - Ph.D. (Iowa State University)
  Regular Graduate Faculty, Semi-supervised learning and design of experiments
- Adrian Tudorascu - Ph.D. (Carnegie Mellon University)
  Regular Graduate Faculty, Partial Differential Equations, Optimal Transport
- Jerzy Wojciechowski - Ph.D. (University of Cambridge)
  Regular Graduate Faculty, Combinatorics, Graph theory

ASSOCIATE PROFESSORS

- Olgur Celikbas - Ph.D. (University of Nebraska)
  Regular Graduate Faculty, Commutative Algebra, Homologic Algebra
- Vito D'Orazio - Ph.D. (Pennsylvania State University)
  Regular Graduate Faculty, Data Sciences
- Renee LaRue - Ph.D. (West Virginia University)
  Associate Graduate Faculty, Undergraduate Mathematics Education
- Kevin Milans - Ph.D. (University of Illinois)
  Regular Graduate Faculty, Combinatorics, Graph Theory, and Partially Ordered Sets
- Lori Ogden - Ph.D. (West Virginia University)
  Associate Graduate Faculty, Undergraduate Mathematics Education, Associate Director for the Institute for Math Learning
- Casian Pantea - Ph.D. (University of Wisconsin-Madison)
  Regular Graduate Faculty, Mathematical biology, dynamical systems
- Vicki Sealey - Ph.D. (Arizona State University)
  Regular Graduate Faculty, Calculus Coordinator, Undergraduate Math Education, Calculus Student Learning
- Charis Tsikkou - Ph.D. (Brown University)
  Regular Graduate Faculty, Hyperbolic and Mixed Type Partial Differential Equations, Conservation Laws

ASSISTANT PROFESSORS

- Krista Bresock - Ph.D. (West Virginia University)
  Undergraduate Mathematics Education
- Ela Celikbas - Ph.D. (University of Nebraska)
  Regular Graduate Faculty, Commutative Algebra, Representation Theory
- Srinjoy Das - Ph.D. (University of California, San Diego)
  Regular Graduate Faculty, Data Sciences
- Ryan Hansen - Ph.D. (West Virginia University)
  Combinatorics
- Cody Hood - Ph.D. (West Virginia University)
  Undergraduate Mathematics Education
- Josh Karr - Ph.D. (West Virginia University)
  Mathematics Education
- Jennifer Kearns - M.S. (West Virginia University)
  Undergraduate Mathematics Education

- Mihyun Kim - Ph.D. (Colorado State University)
  Regular Graduate Faculty, Functional Data Analysis, Extreme Value Analysis, and Time Series Analysis
- Clark Metz - Ph.D. (West Virginia University)
  Higher Education
- Matthew Schraeder - Ph.D. (West Virginia University)
  Undergraduate Mathematics Education
- Ignacio Segovia Dominguez - Ph.D. (Center for Research in Mathematics, A.C.)
  Regular Graduate Faculty, Applied Mathematics, Statistical Modeling and Computer Science
- Youngseok Song - Ph.D. (Colorado State University)
  Regular Graduate Faculty, High-dimensional Statistic, Graphical Model, Large-scale Inferences, Network Analysis
- Iwona Wojciechowska - Ph.D. (West Virginia University)

INSTRUCTORS

- Joelleen Bidwell - M.A. (West Virginia University)
- Gabriel Tapia - M.S. (West Virginia University)
- Galyna Voitiuk - Ph.D. (West Virginia University)
- Sylvanus Waibogha - M.S. (West Virginia University)

PROFESSORS EMERITI

- Anthony A. Billings - M.S. (West Virginia University, A.B.D. (Carnegie Mellon University))
  Statistical Computing, Statistical Modeling, Robust Estimation, Nonlinear Dynamic Systems, Statistical Education
- Gary Ganser - Ph.D. (Rensselaer Polytechnic Institute)
  Modeling, Data Analysis
- John Goldwasser - Ph.D. (University of Wisconsin-Madison)
  Combinatorics, Graph Theory
- Jack T. Goodykoontz Jr. - Ph.D. (University of Kentucky)
  Topology
- Henry W. Gould - M. A. (University of Virginia)
  Number Theory, Combinatorics, Special Functions
- Erdogan Gunel - Ph.D. (State University of New York at Buffalo)
  Bayesian Inference, Biostatistics, Categorical Data Analysis
- Harumi Hattori - Ph.D. (Rensselaer Polytechnic Institute)
  Differential Equations, Continuum Mechanics
- Gerald R. Hobbs - Ph.D. (Kansas State University)
  Biostatistics, Nonparametric Statistics, Regression Analysis
- Hong-Jian Lai - Ph.D. (Wayne State University)
  Graph Theory, Matroid Theory
- Dening Li - Ph.D. (Fudan University)
  Partial Differential Equations
- Michael E. Mays - Ph.D. (Pennsylvania State University)
  Number Theory
- James E. Miller - Ph.D. (University of Kentucky)
  Complex Analysis
- Sherman D. Riemenschneider - Ph.D. (Syracuse University)
  Approximation Theory, Wavelets, Signal Processing
- Cun-Quan Zhang - Ph.D. (Simon Fraser University)
  Graph theory, Combinatorics, Algorithms, Bioinformatics, Data Mining

Admissions for 2026-2027

- First Time Freshmen are admitted directly to the major. For the timely completion of the degree, it is recommended that students have a minimum MATH ACT of 22, a MATH SAT of 540, or an ALEKS score of 45.
- Students transferring from another WVU major or from another institution with fewer than 24 credits and at least a 2.0 overall GPA are admitted directly to the major. For the timely completion of the degree, it is recommended that students have a minimum MATH ACT of 22, a MATH SAT of 540, or an ALEKS score of 45.
- Students transferring from another WVU major or from another institution with 24 credits or more and at least a 2.0 overall GPA must meet the following requirement prior to being admitted to the major: completion of MATH 155 (http://catalog.wvu.edu/search/?P=MATH%20155) with C-.

Major Code: 1457

Degree Progress

- By the end of their second semester (excluding summer) in the major, at minimum, students must have completed MATH 126 with a minimum grade of C-.
- By their 5th semester in the major, students should have completed calculus courses through MATH 261 with a minimum grade of C- and have satisfactorily completed or be enrolled in MATH 303.
- A minimum cumulative and major GPA of a 2.0 must be maintained. Students who do not meet this benchmark will be removed from the major.
- All majors must meet with a department advisor working in mathematics or statistics each semester.

Major Learning Outcomes

MATHEMATICS

Upon successful completion of the B.S. degree, **Mathematics** majors will demonstrate the following competencies:

1. Demonstrate a comprehensive understanding of rigorous mathematical proofs by constructing clear, well-organized, logical-mathematical arguments, accurately replicating essential assumptions, definitions, examples, and statements of important theorems, and describing the logical structure of standard proof formats.
2. Recognize valid arguments, identify logical gaps and flaws, break down complex problems into simpler components, use existing techniques and known results to solve each component, and construct original proofs.
3. Identify, formulate, and abstract mathematical problems using critical thinking skills in key mathematical areas, including calculus, algebra, applied analysis, differential equations, optimization, numerical analysis, and probability.
4. Utilize various advanced mathematical techniques to solve problems and construct effective models. Apply these methods to devise practical solutions and develop strategies for real-world applications across diverse fields such as biology, physics, social sciences, and engineering in both public and private sectors.
5. Ask pertinent questions and perform suitable quantitative analysis, demonstrating basic proficiency in fundamental computer programming techniques and algorithmic thinking necessary for quantitative analysis, validation, and mathematical modeling.
6. Perform numerical and symbolic calculations, simplify expressions, and effectively communicate complex mathematical concepts through written, oral, visual, and symbolic forms.
7. Engage in self-directed learning by independently exploring and mastering new mathematical concepts, techniques, or tools, demonstrating initiative and adaptability in unfamiliar contexts.