



Mathematics

Mathematics, one of the oldest liberal arts disciplines, continues to be an innovative field of study. The Department of Mathematics provides training in mathematics, statistics, and their applications to solve problems in business, engineering, the natural and social sciences, and other disciplines. Students are offered opportunities to grow their passion for mathematics and enrich their understanding of its role in the world through participation in undergraduate research, community teaching, conferences, and clubs. Majors are well-prepared for positions in industry, government, and education, as well as for graduate studies.

THE PROGRAM

Students study mathematics, statistics, and their applications within the Jesuit educational tradition; the program supports Gonzaga's mission of cultivating creativity, innovation, and lifelong learning in students. The program's focus on understanding phenomena encountered in science or those driven by social needs is consistent with the Jesuit traditions of care for the planet and service to society. In addition to focusing on their specific discipline, Math majors develop their critical thinking and expression skills through intensive study in philosophy, religious studies, composition and literature, and other disciplines in the humanities.

An Applied Mathematics degree allows students to combine their interest in mathematics with an interest in a specific scientific field of intellectual activity; these majors can choose to pursue any of nine possible concentrations in Actuarial Science, Biochemistry, Biology, Chemistry, Computer Science, Economics, Environmental Science, Physics, or Statistics (or elect to have no concentration). Some Applied Mathematics concentrations, as well as majors in Mathematics (B.A. or B.S.), can be paired with a concentration in Statistics.

DEGREE PROGRAMS

Gonzaga's Department of Mathematics offers three degrees for students wanting to major in mathematics:

- B.A. Mathematics
- B.S. Applied Mathematics
- B.S. Mathematics

Each of these degree programs is based on a personalized and complementary blend of two broad areas of thought and application:

- Pure mathematics and its foundations
- Applied mathematics in the natural, social, and managerial sciences

Gonzaga also offers minors in:

- Applied Mathematics
- Mathematics
- Statistics



DISTINCTIVE OPPORTUNITIES

Mathematics students at Gonzaga may volunteer for educational outreach programs such as the Saturday Mathematics Tutoring Program. The goal of this program is to provide free mathematics tutoring and enrichment for local K-12 students. The Department also runs the Math Tutoring Lab, a free resource to Gonzaga students staffed by Mathematics professors and selected students.

Departmental clubs include a Math Club, the Gonzaga Society of Women in Mathematics, and a student chapter of the Society of Industrial and Applied Mathematics (SIAM), with some activities sponsored by the Mathematical Association of America (MAA). Majors may also participate in the annual William Lowell Putnam Mathematical Competition held every December.

The Department also offers multiple awards. Underclassmen are nominated to take a mathematics exam, with the top student receiving the Underclassman Award. Leading junior students may earn the Junior Mathematics Award. Top seniors are nominated for the Carsrud Award and the winner receives recognition at the College of Arts and Sciences awards ceremony. Finally, students have the opportunity to be inducted into Gonzaga's chapter of Pi Mu Epsilon, a national honor society whose purpose is to promote and recognize student scholarship and achievement in mathematics.



CURRICULUM

All Mathematics majors take a capstone class in the fall of their final year. Some majors choose to obtain secondary mathematics teaching certification along with their mathematics degree; prospective teachers of mathematics should consult the School of Education for the current state certification requirements. For more information, visit gonzaga.edu/licensuredisclosure.

Upper-level mathematics courses include:

- Abstract Algebra
- Applied Statistical Models
- Chaos and Discrete Dynamical Systems
- Combinatorics and Graph Theory
- Complex Variables
- Experimental Design
- Foundations of Applied Math
- Linear Algebra and Applied Linear Algebra
- Nonlinear Systems and Chaos
- Number Theory and Cryptography
- Numerical Methods
- Operations Research
- Partial Differential Equations
- Probability and Statistics
- Real Analysis
- Stochastic Processes
- Topology

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FOR MORE INFORMATION:
gonzaga.edu/math

GONZAGA
UNIVERSITY

RESEARCH OPPORTUNITIES

Many faculty members advise undergraduate research projects, helping students prepare for graduate school and/or future jobs. Recent projects include:

- Algebraic genetics
- Electrical impedance tomography
- Equidecomposability of polygons
- Equivariant topology
- Free parameter multistep methods
- Knot theory
- Modeling motion of trees in the wind
- Monitoring power networks
- Musical application of Fourier transforms
- Nonlinear stability analysis of an evolution equation for a rhombic planform
- Topological data analysis

Students also regularly present at regional and national conferences. These Gonzaga research experiences have helped our students attain valuable internships and research opportunities at the undergraduate and graduate levels. Recent students have received funding for prestigious undergraduate research opportunities through the National Science Foundation's (NSF) Research Experiences for Undergraduates program.

Some of Gonzaga's Mathematics majors' recent summer research experiences include:

- Central Washington University
- Los Alamos National Lab
- Pacific Northwest National Lab
- Ohio State University
- Ohio Wesleyan University
- Oregon State University
- University of Colorado - Boulder
- University of New Zealand
- University of Southern California
- University of Washington

Some of Gonzaga's Mathematics majors' recent summer internship experiences include:

- Amazon
- Amica
- Asignio
- Boeing
- Samaritan Hospital

OUTCOMES

The combination of a Mathematics or Applied Mathematics major and a comprehensive liberal arts background makes our graduates excellent candidates for careers in science, industry, education, and government. Competent, broadly-educated professionals in mathematics are in great demand. As a field, mathematics boasts more employment opportunities than qualified candidates to fill them. Furthermore, a recent study of 250 occupations based on salary, stress, work environment, and security identifies occupations related to mathematics as among the five most desirable.

Graduates of Gonzaga's Mathematics Department excel in positions in applied mathematics, actuarial science, data science, engineering, statistics, and education. Recent graduates are now teaching middle or high school math, working in industry positions, and pursuing graduate studies.

Recent Gonzaga Mathematics graduates have attended the following institutions for graduate school (including non-math programs like Law School or Economics Ph.D. programs):

- Colorado School of Mines
- Colorado State University
- Florida State University
- Portland State University
- Rensselaer Polytechnic Institute

- University of Aberdeen
- University of Baltimore
- University of California - Los Angeles
- University of Nebraska - Lincoln
- University of Nevada
- University of New Mexico
- University of Notre Dame
- University of Oregon
- University of Utah
- University of Washington
- University of Wisconsin
- Wake Forest University
- Washington State University

Some of the programs and companies that have hired recent graduates of our program include:

- AgWest Farm Credit
- Adidas
- Amica
- Blue Origin
- Battelle
- Booz Allen Hamilton
- ENGIE Insight
- Indie Remix Studios
- Institute for Health Metrics and Evaluation
- Kaiser Permanente
- Liberty Mutual
- Lockheed Martin
- Lytx
- National Security Agency
- Seattle Children's Hospital
- The Bank of New York Mellon
- U.S. Army Corps of Engineers
- U.S. Department of Defense
- Vanguard
- Various school districts

