

University of Arizona  
Department of Mathematics  
Graduate Program

<http://math.arizona.edu/gradprogram>

## Features

Here are some of the main features and benefits for graduate students in our program:

- We offer well-rounded training suitable for a variety of careers in academia, industry, and government.
- Students have the opportunity to create, teach, and apply mathematics.
  - Students benefit from the department’s very strong research program, with a variety of specialties in the general areas of Algebra and Geometry, Analysis, Applied Mathematics, Mathematics Education, and Probability and Statistics.
  - Arizona has a nationally recognized tradition of innovation in teaching and curriculum development for undergraduates. Our graduate students are a key part of this effort—for example, they typically have full responsibility for the courses they teach—and so they benefit directly from the latest developments in undergraduate teaching.
  - Arizona has a well-developed internship program, with close ties to many companies and national laboratories, especially Los Alamos National Lab.
- Our carefully designed academic program features an intense integration workshop, a rigorous core of fundamental mathematics, an early research experience, and ample opportunities to interact with world-class researchers in mathematics and related fields.
- Students are supported financially for up to five or six years through a combination of fellowships, assistantships, and internships.
- The department is located in Tucson, a unique city in the Sonoran Desert and the heart of the historic Southwest.

## Trajectories

The Mathematics Department offers MA, MS, and PhD degrees in a variety of areas encompassing the creation, application and teaching of mathematics. The program begins with an intensive “Integration Workshop” which quickly integrates new students into the intellectual and social life of the department. Students then master a rigorous core of foundational mathematics, including algebra, analysis, geometry, and topology and pass qualifying examinations in these topics. In the second year, students participate in “research tutorial groups” in which a small group of students work closely with a faculty member on a project introducing them to an area of current interest. After more specialized courses, students work with a faculty member working in one of the areas of research mentioned below. For more details on the various trajectories pursued by MA, MS, and PhD candidates, see our web site, especially [math.arizona.edu/gradprogram/prospective/trajectories.html](http://math.arizona.edu/gradprogram/prospective/trajectories.html).

## Research Specialties

Arizona has strong research groups in a number of areas. Here is a rough classification. See [math.arizona.edu/research](http://math.arizona.edu/research) for more details, including a list of faculty in each area.

- Algebra and Geometry
  - group theory, especially computational group theory
  - number theory and arithmetical algebraic geometry
  - topology and geometry
- Analysis
  - analysis and its applications
  - dynamical systems
  - geometric analysis
  - mathematical physics
- Applied Mathematics
  - computational science and numerical analysis
  - fluids and mechanics
  - mathematical biology
  - non-linear waves
  - optical science
- Mathematics Education
  - mathematics education research, teacher preparation, and outreach
  - undergraduate education
- Probability and Statistics

## Financial Support

Students making good progress and fulfilling their teaching obligations are supported by the department through a combination of fellowships, assistantships, and internships. Master's students can expect 2 years of support and PhD students can expect five to six years of support. First year stipends are currently about \$14,740 for the academic year and include tuition and essentially all fees. The amount of support increases as students progress through the program. The cost of living in Tucson is low, especially for housing. Students can typically rent a one-bedroom apartment near campus for well under \$500, or spend even less by sharing a larger apartment or house.

## Teaching Assistantships

In contrast to many other programs, students at Arizona typically have full responsibility for their classes, including giving lectures, assigning and grading homework, and preparing exams. The department provides many resources for students to improve their teaching, including active supervision and mentoring, a special one-unit course for first years TAs, and a weekly seminar in Mathematics Education and Outreach.

## VIGRE Fellowships

The department, in cooperation with the Program in Applied Mathematics, holds a grant for "Vertical Integration in Graduate Research and Education." This grant provides fellowships and travel funds for students pursuing PhDs in mathematics and applied mathematics, and other opportunities. Graduate students may obtain up to 33 months of VIGRE research fellowship funding. See [math.arizona.edu/vigre](http://math.arizona.edu/vigre) for more details.

## Research Assistantships

Some faculty members support students using their grants from the National Science Foundation or other federal agencies. This form of support is normally reserved for PhD students in the later years of the program.

## Arizona Internships in Math, Engineering, and the Sciences

The department has close relations with the Los Alamos and Sandia National Laboratories. Many students do summer internships there and at other national labs and businesses, such as Bell Labs, Apple Computers, Intel, and the RAND Corporation. Arizona Internships in Math, Engineering, and the Sciences (AIMES) serves as an information clearing house for the many existing internship opportunities in government laboratories, industry, corporations, and academic institutions. See [math.arizona.edu/~restrepo/AMII/amii.html](http://math.arizona.edu/~restrepo/AMII/amii.html) for more details.

## Did you know that ...

- There are approximately sixty tenured or tenure-track faculty in the department whose research interests encompass the creation, application and teaching of mathematics.
- Faculty in the Mathematics Department have been awarded the AMS-SIAM Norbert Wiener Prize in Applied Mathematics, the Dirac Medal, a Presidential Young Investigator Award, a Fulbright Award, DOE Early Career Principal Investigator Awards, a Guggenheim Fellowship, the Monroe Martin Prize, the American Statistical Association's Distinguished Service Medal, Sloan Foundation Fellowships and NSF Postdoctoral Research Fellowships.
- Recent graduates from Arizona Mathematics are employed at the University of Texas at Austin, the University of Massachusetts at Amherst, Los Alamos and Sandia National Laboratories, the National Security Agency, and Premera Blue Cross.
- Each year about forty to fifty external funding awards bring approximately \$2 million to the Mathematics Department.
- The Mathematics Department has a close working relationship with the Program in Applied Mathematics. The Program offers the PhD and MS degrees in applied mathematics, and students from the "Program" and "Department" interact extensively.
- Graduate teaching assistants in the Mathematics Department teach their own courses, and the department provide substantial opportunities to help them improve and broaden their teaching portfolios.
- Both VIGRE and IGERT grants from the NSF provide support for graduate students in the Department.
- The Department is a national leader in the use of technology in mathematics education and was awarded the Theodore M. Hesburgh Certificate of Excellence for "Enhancing the Teaching and Learning of Mathematics with Technology."
- The Southwest Center for Arithmetical Algebraic Geometry hosts a winter school which brings together the leaders in the field and the best students for an intensive week of lectures and projects. The Center also hosts a Distinguished Lecture Series.
- The Mathematics Department has close ties to Los Alamos National Laboratories and in particular the Center for Non-Linear Studies.
- Tucson has more than 300 sunny days per year and is surrounded by several mountain ranges with peaks over 9,000 feet.