

## DEPARTMENT OF MATHEMATICS

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### THE UNDERGRADUATE PROGRAM IN MATHEMATICS

This brochure is a brief introduction to the undergraduate mathematics program at Rutgers University, New Brunswick/Piscataway. For more information, consult the departmental web site:

[www.math.rutgers.edu](http://www.math.rutgers.edu)

#### GENERAL INFORMATION

The Department of Mathematics offers about 35 advanced undergraduate courses each year. The diversity and richness of this selection, matched by only a small number of U.S. colleges and universities, is a real asset for students interested in the mathematical sciences. The Department includes about 80 faculty members, with interests ranging over all areas of mathematics.

Over 20,000 students enroll in undergraduate mathematics courses at Rutgers each year. An important role of the undergraduate math program is to help students fulfill requirements in other academic disciplines. Substantial mathematical knowledge is required of students majoring in a wide variety of disciplines, such as engineering, business, and the social, biological, and physical sciences.

The Department of Mathematics also has a rigorous program for a major in mathematics, with over 100 math majors graduating each year.

#### JOBS AFTER GRADUATION

Most mathematics majors from Rutgers take positions providing mathematical support for industry, banking/brokerage, and insurance. Many teach in the high schools. Some go on to graduate or professional school in subjects such as statistics, computer science, mathematics, operations research, engineering, law, business, or medicine. For more information, see the link “Careers in Math” here:

[math.rutgers.edu/academics/undergraduate/careers/](http://math.rutgers.edu/academics/undergraduate/careers/)

*The descriptions below have been condensed—see the online catalog for the authoritative version of these requirements:*  
[www.math.rutgers.edu/courses/RUcatalogs.html](http://www.math.rutgers.edu/courses/RUcatalogs.html)

#### THE MINOR IN MATHEMATICS requires:

- Three terms of Calculus (typically Math 151, 152, and 251),
- Introductory Linear Algebra (Math 250), and
- Four 3- or 4-credit electives chosen from Math 244/252 and 300- or 400-level math courses

#### THE MAJOR IN MATHEMATICS

To declare the math major program, students must earn a grade of C or better in three terms of calculus.

All mathematics majors must complete:

- Three terms of Calculus (typically Math 151, 152, and 251),
- Introductory Linear Algebra (Math 250),
- Differential Equations (Math 252),
- An introductory Computer Science course (01:198:107 or 01:198:111),
- All requirements for one of the three options below.

#### Option A. Standard Mathematics Major

Eight additional 3- or 4-credit courses in Mathematics (subject code 640) at the 300- or 400-level, including:

- Intro. to Math Reasoning (Math 300)
- a Real Analysis course (Math 311, 312, or 411), and
- an Abstract Algebra course (Math 351 or 451) or Linear Algebra (Math 350).

The remaining five courses are electives. See the departmental website or the university catalogue for a list of such courses. An appropriate graduate course at Rutgers may be substituted with departmental approval.

## Option B. The Honors Track

The *Honors Track* provides qualified students with a richer, more rigorous, and more personal experience than the standard major. It is especially (but not exclusively) intended for students aiming to do graduate work in Mathematics or a related field. The honors track normally includes the demanding advanced honors sequences Math 411-412 and Math 451-452, as well as two semesters of one-credit honors math seminars. Students who successfully complete the Honors Track graduate with a Bachelor of Science (B.S.) in Mathematics.

Admission to this track is on a rolling basis: applications are reevaluated each semester, with students being admitted once they have a strong enough record to demonstrate their ability to complete the program. Interested students are encouraged to apply for honors versions of calculus courses and (especially) an honors section of Math 300.

## Option C. The Actuarial Track

This option is primarily for students who want to enter the actuarial profession after graduation. This option provides the foundation needed to prepare for three of the Society of Actuaries Exams (P, FM, and LTAM), and to earn certifications in statistical and economic subject areas upon entering the profession.

Future actuaries typically seek an internship with an insurance company or consulting firm between their junior and senior years. Many of these firms actively recruit through Rutgers Career Services.

Some students interested in the actuarial profession may consider a major in mathematics and a minor in economics (or a double major in these areas) rather than the Actuarial Track. This includes students who intend to pursue a broader mathematical education, possibly including graduate studies in mathematics or Mathematical Finance.

## INTERDISCIPLINARY MAJORS

**Statistics-Mathematics Major:** This major is administered by the Statistics Department. For more information, see: [statistics.rutgers.edu](http://statistics.rutgers.edu)

**Bio-Mathematics Major:** This major is administered by the Department of Mathematics; for details consult the mathematics advisor or see: [biomath.rutgers.edu](http://biomath.rutgers.edu)

## FIVE-YEAR B.A./M.A. PROGRAMS

In these programs, students take extra credits while earning a Bachelor's degree. These credits can be transferred to the Master's program. With careful planning, the Master's degree can be obtained in one additional year of full-time study.

Interested students apply in their third year, but advanced planning is needed. Students should consult both departments involved as early as possible.

There are five-year programs in

- Math Education (with certification)
- Statistics
- Mathematical Finance
- Industrial & Systems Engineering

See: [math.rutgers.edu/academics/undergraduate/five-year-ba-ma](http://math.rutgers.edu/academics/undergraduate/five-year-ba-ma)

## STUDENT EMPLOYMENT OPPORTUNITIES

Students may apply to the Department to become graders or tutors. Hiring decisions are based primarily on the strength of the applicant's academic record. Positions may also be available as tutors or learning assistants through the Rutgers Learning Centers.

## ADVISING

Each math major should consult the math advisor at least once each semester while registering for the next semester. The math advisor can be contacted at

[advisor@math.rutgers.edu](mailto:advisor@math.rutgers.edu)

## OPPORTUNITIES FOR ADVANCED STUDY

The Math Department offers honors versions of calculus courses and some upper-level courses, such as the introductory proofs class Math 300, as well as honors seminars and a problem-solving seminar. Entry is determined by the Department and is based on past performance in math courses.

The Rutgers Math Graduate Program is one of the top programs in the United States. Undergraduates, with the consent of the Department, may take courses in this program. For information on how to do so, contact the head advisor.

## DEPARTMENTAL HONORS

Qualified students can graduate with departmental honors. (This is related to, but distinct from, the Honors Track.) To do this, a math major must maintain a GPA of at least 3.4 in math courses and complete two approved honors units, such as Math 411-412, 451-452, or graduate math courses. For details, see:

[math.rutgers.edu/academics/undergraduate/honors](http://math.rutgers.edu/academics/undergraduate/honors)

## UNDERGRADUATE RESEARCH

Students with a strong mathematical background can get a taste of research in math by working with a professor. Good computer skills may be required. Graduation credit is available with prior approval.

The Department and the Rutgers DIMACS Center offer summer Research Experiences for Undergraduates (REUs) in mathematics. These are residential programs in which students carry out a research project under the direction of a faculty advisor and participate in seminars and other professional activities. Participants receive a stipend and housing. See [dimacs.rutgers.edu/REU](http://dimacs.rutgers.edu/REU) for information on our REU programs, and see [www.nsf.gov/crssprgm/reu/](http://www.nsf.gov/crssprgm/reu/) for similar programs nationwide.