

This is an archived version of the undergraduate program webpage.

Undergraduate Programs

See also the BU page about our undergraduate programs.

This webpage contains general information about our undergraduate programs for people who are exploring what is available. Current students of Binghamton University should visit the [Undergraduate Advising](#) page for more information.

The Department of Mathematics and Statistics offers the following undergraduate degree programs:

- **Bachelor of Arts in Mathematical Sciences**, with
 - a **Mathematics** Track,
 - a **Statistics** Track, and
 - an **Actuarial Science** Track.
- **Bachelor of Science in Mathematical Sciences**, with
 - a **Mathematics** Track, and
 - an **Actuarial Science** Track.
- Minor in Mathematics

We offer various accelerated degree programs, allowing students to obtain a bachelor's degree and a master's degree in five years. Specially, we offer a [4+1 degree program](#) combining a **BA/BS in Mathematical Sciences degree (any track) with MA in Statistics degree**.

To declare or drop a major or minor in the Department of Mathematics and Statistics, fill in this Google Form. To change from one major to another, simply drop the old major, then declare the new one.

You need to log in to your Bmail account to see the form. **Please do not declare your major multiple times in a short time period to avoid human errors.**

Any student wishing to declare a major in the Department of Mathematics and Statistics needs to be admitted to Harpur College of Arts and Sciences first; otherwise, the declaration can not be processed.

If you are new to the math major/minor, please spend a few minutes to read answers to some Frequently Asked Questions, compiled by [Xingye Qiao](#), the Director of Undergraduate Studies.

Overview

Mathematics belongs both to liberal arts and to sciences. Not only is it the language of science (including social science), but it is also studied for its own beauty. It is therefore one of the most vital and lively subjects in the university curriculum. In the technology-oriented climate of today, the department's graduates have excellent employment opportunities. The websites below provide some resources on the career perspective for math graduates.

- What Do Mathematicians Do?
- What Do Statisticians Do?
- What Do Actuaries Do?

Mathematicians and statisticians are in demand, not only in mathematics teaching and research, and in the traditional fields of physics, chemistry, computer science, and engineering, but also, and increasingly, in business, economics, environmental sciences, geology, biology and the health sciences among others. Knowledge of computer science is useful for many applications of mathematics.

The Department of Mathematics and Statistics has programs leading to a BA or BS degree in Mathematical Sciences.

The preliminary lower-level courses required for all students are calculus I-III, linear algebra, and number systems.

Mathematics Tracks (BA/BS)

The BA program in Mathematical Sciences is highly flexible and allows each student to fashion a course of study to meet his or her individual needs and interests. The BA track in Mathematics emphasizes both the *breadth* and *depth*. The student is encouraged to experience different areas in mathematical sciences. Core areas of Mathematics include Analysis, Algebra and Geometry/Topology. Other areas include Actuarial Science, Statistics, Combinatorics, Computer Science, and others. A student is required to finish one upper-level course from each of the three core areas, and two additional upper-level courses. The five upper-level courses must include a pairing of two courses in the same area to be selected from a list, according to the student's interests.

The challenging BS degree program provides excellent preparation for graduate work at any university. Students considering a BS degree should seek advice as early as possible and plan their schedules carefully to meet the demanding requirements. In addition to the five lower-level courses, the BS degree requires 11 upper-level courses, include six courses from the core areas, and five upper-level elective courses.

Statistics Track (BA)

Statistics is the discipline that concerns the collection, organization, analysis, interpretation, and presentation of data. It is concerned with data in the context of uncertainty and decision making in the face of uncertainty. Statistics is primarily mathematical in nature but has grown through applications in the social sciences (such as economics), natural sciences (such as physics and biology), as well as business and engineering, to become its own separate, though closely allied, field. Inferences in mathematical statistics are made under the framework of probability theory. Modern statistics in the 21st century focus more and more on computing and algorithms.

The BA track in Statistics is designed to provide a solid mathematical and statistical foundation for a successful career in statistics, data analysis, and data science. It offers students the possibility of expanding the interdisciplinary aspect of the program by completing a second major. For example, students may combine statistics with computer science, biology, psychology, economics, accounting, finance, management science, or social science.

The BA track in Statistics requires 12.5 courses in Mathematical Sciences (that is 12 full-semester courses and one half-semester course).

Actuarial Tracks (BA/BS)

Actuaries are the leading professionals in finding ways to manage risk. It takes a combination of strong analytical skills, business knowledge, and understanding of human behavior to manage today's complex risks facing our society. Actuaries analyze and solve complex business and social problems related to financial risks, such as in insurance and pension plans.

The BA/BS tracks in Actuarial Science are designed to prepare students for an actuarial career. Professional advancement results from passing a series of examinations administered by the actuarial societies and by the completion of specific courses approved by the actuarial societies.

The BA track in Actuarial Science requires 10.5 courses in Mathematical Sciences (that is 10 full-semester courses and one half-semester course) and 2 courses in Economics.

The more challenging BS track is designed for students who may wish to pursue a graduate degree in Actuarial Science or related fields, and it entails 14.5 courses in Mathematical Sciences and 4 courses in Economics.

The preliminary lower-level courses required for all students are calculus I-III, linear algebra, and number systems.

Other required courses for all actuarial students are Probability Theory (Math 447), Mathematical Statistics (Math 448), Intro. to Financial Math (Math 346), and Intro. to Scientific Computing (Math 329).

Mathematics Minor

A minor in Mathematical Sciences requires the student to complete, with a grade of C or higher, at least 24 credits from courses numbered above MATH 300 of which at least 12 credits are from courses numbered MATH 330 or above. Some of these courses can be transfer courses, independent studies, or computer science courses. See the University Bulletin for details. Students interested in pursuing a Mathematics minor should consult with the Director of Undergraduate Studies.

Teaching Math

For students interested in becoming math teachers, Binghamton offers:

- BA/BS degrees in mathematics. Either the BA (Mathematics Track) or BS (Mathematics Track) is suitable preparation for a Masters in Teaching program,
- An undergraduate minor in Education
- A Master of Arts in Teaching (MAT) in Mathematics Adolescent Education
- Accelerated program in BA in Mathematics and MAT in Mathematics Adolescence Education (also known as the combined 3+2 program.)

The accelerated program allows well-prepared students to complete the Mathematics BA and Master of Arts in Teaching (Mathematics Adolescent Education) in 5 years. Transfer students are not eligible for the accelerated program. Students can also complete the Bachelors and Masters program independently.

Here is a [list of recommended courses](#) for future math teachers.

Accelerated Programs

An accelerated program allows a student to obtain a bachelor's degree and a master's degree in five years. You complete most of the coursework for your bachelor's degree in your first three years. In your fourth year, you take both bachelor's- and master's-level courses, graduate with your bachelor's degree, and formally apply to the Graduate School. In your fifth year, you are admitted to Graduate School and focus solely on graduate coursework.

Check the Graduate School's website for the Accelerated Programs for details.

Honors, Awards and Scholarships

Every semester, we grant to our best graduating majors a distinction called "honors". Learn about graduation honors from [this page](#).

The department hosts a local chapter of Pi Mu Epsilon, the National Mathematics Honor Society.

In addition to departmental graduation honors, the department grants several awards and scholarships each year to students who have made outstanding achievements in mathematical sciences. These awards include the following.

- **Award for Excellence in Mathematical Sciences** – presented to outstanding graduating seniors majoring in mathematical sciences.
- **Actuarial Science Award** – presented to actuarial science students with academic excellence.
- **Helen P. Beard Award for Excellence in Undergraduate Mathematics** – established by Gerald Miller '67 in honor of Professor Emeritus Helen Pearl Beard, who retired in 1982 and passed away in January of 2004 at the age of 88. Presented to a junior or senior major who demonstrates qualities exemplified by Professor Beard.
- **Lawrence I. Wilkins Scholarship** – awarded to a Harpur student majoring in math with academic excellence. Recipients are selected in the Spring for the following academic year.
- **Miguel Arcones Memorial Award** – established in 2013 to honor the memory of Professor Miguel Arcones. Awarded to a graduating senior who has demonstrated academic excellence. Preference will be given to a student in the actuarial program.
- **Award for Putnam Competition and Problem Solving** – presented to undergraduate majors in the Department of Mathematics and Statistics who participated in and received good results in the Putnam Mathematics Competition and/or the Problem of the Week problem-solving series.

Many awards are made possible because of donations from our alumni and friends.

Student Activities

- The Undergraduate Math Club and MAA student chapter at Binghamton University.
- The Association for Women in Mathematics Student Chapter at Binghamton University.
- The Data Science and Analytics Club
- [The Actuarial Association](#).
- Undergraduate Research Center: current research opportunities.
- Binghamton has a local chapter of Pi Mu Epsilon, the National Mathematics Honor Society.
- The department is a participant in the Seaway Section of the MAA.

Interested in a visit

If you are a prospective student who is interested in visiting the department and talking with our faculty members, you can make an appointment with the [department secretary](#).

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<https://www2.math.binghamton.edu/> - **Department of Mathematics and Statistics, Binghamton University**

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