Mathematics is of ever-increasing importance to our society and everyday life. It has long been the language of science and technology, and provides a rich source of methods for analyzing and solving problems encountered in the physical world. Today, mathematics is essential in virtually all fields of human endeavor, including business, the arts, and the social sciences.

The Bachelor of Arts degree requires at least eleven mathematics courses and two physics courses, in addition to the study of a foreign language; this program is appropriate for students who wish a broader liberal arts education. The Bachelor of Science degree requires at least fourteen mathematics courses and two physics courses but no foreign language study; it is more specialized, and it is recommended for those strongly interested in mathematics and science. The department also offers a minor degree in mathematics.

The major programs provide flexibility with elective courses. Students may take advantage of a range of interdisciplinary programs and may join a major in mathematics with one in such fields as computer science, physics, and biology.

Exceptional students are accepted into the Honors Program, and have the option to enroll in honors sections of several of their mathematics courses. All math majors may benefit from co-op opportunities in the scientific and business communities in Boston and elsewhere.

Many of the mathematics courses that we offer use computers for visualization, modeling, and numerical approximation. The math computer lab features twenty-two personal computers supported by student mentors in a pleasant physical environment.

Students planning to teach secondary-school mathematics must major in mathematics and take a specific minor in education, which includes course work and student teaching.

Mathematical training may lead to opportunities in applied research (natural sciences, engineering, economics, management, computer science) as well as in mathematical research, teaching, or industry.

Transferring to the Major
Upperclass students transferring to mathematics must have a cumulative GPA of at least 2.000. They must also have at least a 2.000 GPA in all mathematics courses and a minimum grade of C in the following courses (if already taken):

- MTH U165 Introduction to Mathematical Reasoning 4 SH
- MTH U241 Calculus 1 for Science and Engineering 4 SH
- MTH U242 Calculus 2 for Science and Engineering 4 SH
- MTH U341 Calculus 3 for Science and Engineering 4 SH
- MTH U371 Linear Algebra 4 SH

Acceptance in the major will be based on students’ meeting the department’s criteria for admission and availability of space in the major.

Academic Progression Standards
Students who begin as freshman mathematics majors must, after the fourth semester, satisfy the following: (a) have completed at least six of their required mathematics and physics courses; (b) have a grade average of C or better in the following courses:

- MTH U165 Introduction to Mathematical Reasoning 4 SH
- MTH U241 Calculus 1 for Science and Engineering 4 SH
- MTH U242 Calculus 2 for Science and Engineering 4 SH
- MTH U341 Calculus 3 for Science and Engineering 4 SH
- MTH U371 Linear Algebra 4 SH

and (c) have a GPA of at least 2.000 in all required mathematics and physics courses.

Students who transfer to the major must, after two semesters in the major, satisfy the following: (a) have completed at least four of their required mathematics and physics courses; (b) have a GPA of at least 2.000 in all required mathematics and physics courses; and (c) have grades of C or better in the following courses (if already taken):

- MTH U165 Introduction to Mathematical Reasoning 4 SH
- MTH U241 Calculus 1 for Science and Engineering 4 SH
- MTH U242 Calculus 2 for Science and Engineering 4 SH
- MTH U341 Calculus 3 for Science and Engineering 4 SH
- MTH U371 Linear Algebra 4 SH

Students who fail to achieve the above conditions will be placed on departmental probation. Students who remain two consecutive semesters on departmental probation will be dismissed from the major.
BA in Mathematics

**NU CORE REQUIREMENTS**
See page 42 for requirement list.

**COLLEGE REQUIREMENTS FOR BA**
See page 69 for requirement list.

**MATHEMATICS MAJOR REQUIREMENTS FOR BA**

**Problem Solving**
Complete the following course:
- MTH U165 Introduction to Mathematical Reasoning 4 SH

**History of Mathematics**
Complete the following course:
- MTH U201 History of Mathematics 4 SH

**Calculus**
Complete the following three courses:
- MTH U241 Calculus 1 for Science and Engineering 4 SH
- MTH U242 Calculus 2 for Science and Engineering 4 SH
- MTH U341 Calculus 3 for Science and Engineering 4 SH

**Intermediate and Advanced Mathematics**
Complete the following four courses:
- MTH U371 Linear Algebra 4 SH
- MTH U550 Real Analysis 4 SH
- MTH U560 Geometry 4 SH
- or MTH U430 Number Theory 4 SH
- MTH U575 Group Theory 4 SH
- or MTH U565 Topology 4 SH

**Co-op Reflections**
Complete one of the following courses:
- MTH U300 Co-op Reflections Seminar 1 1 SH
- MTH U400 Co-op Reflections Seminar 2 1 SH

**Mathematics Electives**
Complete two electives from the following list:
- MTH U401 to MTH U799

**Required Physics**
Complete the following two courses with corresponding labs:
- PHY U161 Physics 1 4 SH
  with PHY U162 Lab for PHY U161 1 SH
- or PHY U151 Physics for Engineering 1 4 SH
  with PHY U152 Lab for PHY U151 1 SH
- PHY U165 Physics 2 4 SH
  with PHY U166 Lab for PHY U165 1 SH
- or PHY U155 Physics for Engineering 2 4 SH
  with PHY U156 Lab for PHY U155 1 SH

**MATHEMATICS MAJOR CREDIT REQUIREMENT**
A grade of C or higher is required in all mathematics courses at level 399 and lower.

---

**BS in Mathematics**

**NU CORE REQUIREMENTS**
See page 42 for requirement list.

**MATHEMATICS MAJOR REQUIREMENTS FOR BS**

**Problem Solving**
Complete the following course:
- MTH U165 Introduction to Mathematical Reasoning 4 SH

**Calculus**
Complete the following three courses with a grade of C or higher:
- MTH U241 Calculus 1 for Science and Engineering 4 SH
- MTH U242 Calculus 2 for Science and Engineering 4 SH
- MTH U341 Calculus 3 for Science and Engineering 4 SH

**Intermediate and Advanced Mathematics**
Complete the following five courses:
- MTH U345 Ordinary Differential Equations 4 SH
- MTH U371 Linear Algebra 4 SH
- MTH U481 Probability and Statistics 4 SH
- MTH U550 Real Analysis 4 SH
- MTH U575 Group Theory 4 SH

**Co-op Reflections**
Complete one of the following courses:
- MTH U300 Co-op Reflections Seminar 1 1 SH
- MTH U400 Co-op Reflections Seminar 2 1 SH

**Mathematics Electives**
Complete five electives from the following list:
- MTH U401 to MTH U799

**Required Physics**
Complete the following two courses with corresponding labs:
- PHY U161 Physics 1 4 SH
  with PHY U162 Lab for PHY U161 1 SH
- or PHY U151 Physics for Engineering 1 4 SH
  with PHY U152 Lab for PHY U151 1 SH
-PHY U156 Lab for PHY U155 1 SH
**PHYSICS REQUIREMENTS**

**Physics 1**
Complete one of the following courses with corresponding lab:

- **PHY U161** Physics 1 4 SH
  - with **PHY U162** Lab for PHY U161 1 SH
- **PHY U151** Physics for Engineering 1 4 SH
  - with **PHY U152** Lab for PHY U151 1 SH

**Physics 2**
Complete one of the following courses with corresponding lab:

- **PHY U165** Physics 2 4 SH
  - with **PHY U166** Lab for PHY U165 1 SH
- **PHY U155** Physics for Engineering 2 4 SH
  - with **PHY U156** Lab for PHY U155 1 SH

**Intermediate Physics**
Complete the following three courses:

- **PHY U303** Modern Physics 4 SH
- **PHY U305** Thermodynamics and Statistical Mechanics 4 SH
- **PHY U371** Electronics 4 SH

**Advanced Physics**
Complete the following two courses:

- **PHY U600** Advanced Physics Laboratory 1 4 SH
- **PHY U602** Electricity and Magnetism 4 SH

**Elective Courses**
Complete two physics courses in the following range:

- **PHY U400** to **PHY U799**

**INTEGRATIVE COURSES**
Complete the following two courses:

- **MTH U545** Fourier Series and PDEs 4 SH
- **MTH U525** Applied Analysis 4 SH
  - or **MTH U550** Classical Dynamics 4 SH

**MATHEMATICS AND PHYSICS DUAL-MAJOR CREDIT REQUIREMENT**
Complete 83 semester hours in the major.

**GENERAL ELECTIVES**
Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

**COOPERATIVE EDUCATION**
If elected

**UNIVERSITY-WIDE REQUIREMENTS**
128 total semester hours required
Minimum 2.000 GPA required

---

**BS in Mathematics and Physics**

**NU CORE REQUIREMENTS**
See page 42 for requirement list.

**MATHEMATICS REQUIREMENTS**

**Calculus**
Complete the following three courses with a grade of C or higher:

- **MTH U241** Calculus 1 for Science and Engineering 4 SH
- **MTH U242** Calculus 2 for Science and Engineering 4 SH
- **MTH U341** Calculus 3 for Science and Engineering 4 SH

**Intermediate and Advanced Mathematics**
Complete the following five courses:

- **MTH U345** Ordinary Differential Equations 4 SH
- **MTH U371** Linear Algebra 4 SH
- **MTH U481** Probability and Statistics 4 SH
- **MTH U550** Real Analysis 4 SH
- **MTH U575** Group Theory 4 SH

**Co-op Reflections**
Complete one of the following courses:

- **MTH U300** Co-op Reflections Seminar 1 1 SH
- **MTH U400** Co-op Reflections Seminar 2 1 SH

**Mathematics Electives**
Complete one mathematics course in the following range:

- **MTH U401** to **MTH U799**

---

**BS in Computer Science and Mathematics**
See page 275.

**BS in Environmental Geology and Mathematics**
For degree requirements, please visit the myNEU Web Portal (www.myneu.neu.edu), click on the “Self-Service” tab, then on “My Degree Audit.”
BS in Geology and Mathematics
For degree requirements, please visit the myNEU Web Portal (www.myneu.neu.edu), click on the “Self-Service” tab, then on “My Degree Audit.”

Minor in Mathematics

REQUIRED COURSES
Complete the following two courses:
- MTH U241 Calculus 1 for Science and Engineering 4 SH
- MTH U242 Calculus 2 for Science and Engineering 4 SH

Biology majors may substitute the following two courses:
- MTH U151 Calculus and Differential Equations for Biology 1 4 SH
- with MTH U152 Calculus and Differential Equations for Biology 2 4 SH

INTERMEDIATE-LEVEL COURSES
Complete two courses from the following list. Students may not take both MTH U343 and MTH U345 to satisfy this requirement:
- MTH U341 Calculus 3 for Science and Engineering 4 SH
- MTH U343 Differential Equations and Linear Algebra for Engineering 4 SH
- or MTH U345 Ordinary Differential Equations 4 SH
- MTH U371 Linear Algebra 4 SH

MATHEMATICS ELECTIVES
Complete two courses in the following range:
MTH U401 TO MTH U699

GPA REQUIREMENT
2.000 GPA required in the minor