

Department of Mathematics

Northeastern Illinois University

Chicago, IL 60625

Handbook for Math Majors

Math Dept Office
Brommel Hall 214C/B
(Formerly the Science Building)
(773)442-5760 or 5776

Advisors:

Math Education majors: Prof. Anna Mitina
BBH 218C 773-442-5778, a-mitina@neiu.edu

Applied Math majors: Prof. Marina Polyashuk
BBH 212D 773-442-5774, m-polyashuk@neiu.edu

February 2012

FACULTY

Paul O'Hara (Chair)

Tanya Cofer

Lidia Filus (Associate Chair)

Marian Gidea (Advisor, Math Club and MS applied track)

Wagala Gwanyama

Anna Mitina (Advisor to Math Education Majors)

Sarah Cordell

Anuj Mubayi

Marina Polyashuk (Advisor to Applied Math Major and all Math Minors)

Rakesh Rustagi

David Rutschman (also Associate Dean of College of Arts and Sciences)

Nancy C. Wrinkle

Zhonggang Zeng

INTRODUCTION

The undergraduate programs in Mathematics at Northeastern Illinois University lead to a Bachelor of Arts degree in Mathematics and have been designed to provide the student with options suitable for various career plans. Mathematics majors at Northeastern choose two programs:

- Teaching of Secondary Mathematics
- Applied Mathematics

The choice of programs determines the mathematics courses required, as well as those that can be taken as electives.

Because of recent advances in technologies, there are many new applications of mathematics and consequently many career opportunities in these areas. Our programs are designed to prepare a mathematics major for jobs currently offered by industrial, business, government and educational institutions. The choice of a program should reflect the student's academic interests well as career plans.

Mathematics provides techniques that can be applied to solve problems in many fields. In order to fully use what one has learned in mathematics, it is important to be well-versed in an application area.

The Mathematics Department has institutional memberships in the American Mathematical Society, Society for Industrial and Applied Mathematics, and the Association for Women in Mathematics. The Math Club has been organized which is open to all students with an interest in mathematics.

Also, there is a weekly seminar series in the mathematical sciences during the semester, sponsored by the Computational Dynamics in Physics and Populations Research Community, the Society of Physics Student and The NEIU Math Club.

PROGRAMS OF STUDY

A) Teaching of Secondary Mathematics

This program is designed to provide future teachers with a strong background in the concepts and the applications that underlie the mathematics taught at the high school level. The course of study is in keeping with the recommendations of the Committee on the Undergraduate Program in Mathematics (CUPM) and the National Council of Teachers of Mathematics (NCTM). This major prepares a student for high school teaching as well as for further graduate studies at Northeastern or elsewhere

Requirements: Students in this program are required to follow the professional sequence in Secondary Education from the Department of Curriculum and Instruction. This requires 28 hours of coursework in the College of Education. Contact Mr. Michael Bochnewych, SCED Advisor, and Classroom Building 3034, phone (773) 442-5387. Also see:

<http://www.neiu.edu/~teachedu/seced.htm>

B) Applied Mathematics

This program is designed to provide a thorough training in applied mathematics, including Statistics, Operations Research, and/or Scientific Computing. This major has the potential for careers in scientific, business, industrial and/or actuarial areas, in positions like statisticians, software engineers, programmers or consultants. This program also prepares majors for further graduate study at Northeastern or elsewhere.

Students in Applied Mathematics who take Math 306 (Linear Programming and Extensions); Math 307 (Probability Models for Operation Research); and Math 304 (Numerical Analysis) have an appropriate background for taking several Actuarial Examinations. With these added courses a student is prepared for work in the insurance and pension industry, as well as for consulting in private or government agencies.

GRADUATE PROGRAMS

The Mathematics Department offers an M.S. degree in mathematics with concentrations in Applied Mathematics and Secondary Education. The undergraduate programs in the Department satisfy the requirements for admission to the corresponding M.S. program provided the student maintains at least a “B” average in all 300-level courses.

The Department also offers an M.A. degree in Mathematics for Elementary Teachers. This program is *specifically* designed for in-service elementary school teachers. It is *not* a program leading to an M.A. in mathematics.

For more information on our graduate programs, please consult the handbooks for these programs or contact the advisors (listed inside the front cover of this handbook).

Teaching of Secondary Mathematics course requirements (eleven required, two elective courses)

Required Courses (prerequisites in parentheses):

Math 187	Calculus I (Pre-Calculus)
Math 202	Calculus II (Calculus I)
Math 203	Calculus III (Calculus II)
Math 243	Linear Algebra I (Calculus I)
Math 251	Discrete Mathematics (Calculus I)
Math 305	Probability and Statistics (Calculus II)
Math 340	Computing for Mathematicians (Calculus II)
Math 312	Foundations of Geometry (Lin. Alg. I & Discrete Math)
Math 321	History of Mathematics (Lin. Alg. I & Disc. Math)
Math 331	Foundations of Algebra I (Lin. Alg. I & Discrete Math)
Math 338	Advanced Calculus: Single Variable (Calculus III & Discrete Mathematics)

Elective Courses:

One elective course must be chosen from the list below:

- Math 322 Number Theory (Lin. Alg. I & Discrete Math)
- Math 332 Foundation of Algebra II (Found. of Algebra I)
- Math 337 Theory of Equations (Calc II & Discrete Math)

One elective course must be chosen from the list below:

- Math 301 Ordinary Differential Equations I (Calc III)
- Math 304 Introduction to Numerical Analysis (Calc III, Computing for Mathematicians, & Lin. Algebra I)
- Math 306 Linear Programming and Extensions (Calc III & Linear Algebra I)
- Math 334 Mathematical Statistics I (Calc III)

Applied Mathematics course requirements (eight required, five elective courses)

Required Courses (prerequisites in parentheses):

Math 187	Calculus I (Pre-Calculus)
Math 202	Calculus II (Calculus I)
Math 203	Calculus III (Calculus II)
Math 243	Linear Algebra I (Calculus I)
Math 251	Discrete Mathematics (Calculus I)
Math 340	Computing for Mathematicians (Calculus II)
Math 334	Mathematical Statistics I (Calculus III)
Math 336	Mathematical Statistics II (Math. Stats. I)

Elective Courses:

Five elective courses must be chosen from courses listed below, with **at least one of Math 338 or Math 339**

Math 301	Ordinary Differential Equations I (Calc III)
Math 302	Ordinary Differential Equations II (ODE I)
Math 303	Partial Differential Equations (ODE I)
Math 304	Numerical Analysis (Calc III, Computing for Mathematicians, & Linear Algebra I)
Math 306	Linear Programming and Extensions (Calc III & Linear Algebra I)
Math 307	Probability Models for Operations Research (Probability and Statistics)
Math 309	Numerical Analysis II (Numerical Analysis I)
Math 328	Complex Variables (Advanced Calculus Single Variable or Multi-variable)
Math 338	Advanced Calculus: Single Variable (Calculus III & Discrete Math)
Math 339	Advanced Calculus: Multi-variable (Calculus III & Linear Algebra I)
Math 343	Linear Algebra II (Calculus III & Linear Algebra I)
Math 365	Statistics Computer Packages (Math. Stats I & Computing for Mathematicians)

Other helpful information

Declaring the major: It is advisable for a students to complete a Calculus course before declaring this major. Declaration of Major forms are available from the advisor or the Mathematics department offices.

Scheduling: To accommodate working students most of our upper level courses are offered in the late afternoon and evening.

D-grade policy: Courses in which a student has earned a D will not count toward meeting graduation requirements in Mathematics. The student may either repeat the course or, if the course is not required in the program, take an alternate course. The same applies to courses transferred from other institutions.

Tutored study: Tutored study allows a student to take a course listed in the catalog but which is not regularly offered. Students meet individually with the instructor several hours a week. Tutored study courses require approval of the Department and the Dean of the College of Arts and Sciences at least two weeks before registration. Required courses are not given on a tutored study basis. No instructor is under any obligation to offer tutored studies.

Residency requirement: All students majoring in Mathematics at Northeastern Illinois University are required to take at least four 300-level Mathematics courses (chosen with the approval of the advisor) and a total of 15 credits in the major in residency.

Other requirements: Students are responsible for satisfying General Education and University requirements. All students are required to complete at least 18 200- or 300-level credit hours and 24 300-level credit hours. You may wish to consult the advisor on these matters.