

# Mathematical Sciences



Mathematics is still the basis for understanding and solving economic, scientific, engineering, physics and business problems. It's also one of the most dynamic fields in which to work.

Mathematicians use computational techniques, algorithms, and the latest technology to meet the ever-increasing demand for data analysis and statistical information. At NIU, you'll not only learn the fundamentals but one also choose electives that prepare you for graduate school, professional school or dozens of exciting careers in this challenging and vital field.

## Academic support

We would like every student to succeed in our courses. Our faculty members are always willing to help, and we encourage you to reach out to them.

One-on-one and group tutoring sessions are available from the Mathematics Assistance Center in DuSable 326. We offer topic sessions throughout the week which summarize main points and answer questions posed in the previous week's material. We also offer exam review sessions and practice exams. Tutoring is also available through the university's ACCESS Tutoring and Support Services.

## Scholarships and Awards

Merit scholarships are available for incoming and continuing students. These opportunities range from \$500-\$4,000 and you can apply online via the MyScholarships system. We also have a number of financial awards that we also present numerous financial awards at the end of the year or even upon graduation to reward achievement.

## Degree Offerings

We offer a Bachelor of Science (B.S.) degree with emphases in the following areas:

- General mathematics
- Applied mathematics
- Computational mathematics
- Mathematics education (teach grades 9-12)

Minors are available in:

- Applied Mathematics
- General Mathematics
- Secondary Mathematics Education



NORTHERN ILLINOIS UNIVERSITY

**Department of  
Mathematical Sciences**

*College of Liberal Arts and Sciences*

# Degree Requirements

The department offers a Bachelor of Science (B.S.) degree in mathematical sciences with emphases in four areas:

- **General Mathematics** - appropriate choice if you wish to pursue graduate degrees, or attend professional school, teach in a community college or above.
- **Applied Mathematics** - appropriate choice if you're interested in problems arising from industry or engineering, and prepares you for many technical fields.
- **Computational Mathematics** - investigates the nature of computation and the methods used to compute mathematical quantities accurately and efficiently.
- **Mathematics Education** - you'll earn both a mathematics degree and an Illinois State licensure to teach in secondary schools. Learn more at [go.niu.edu/math-licensure](http://go.niu.edu/math-licensure).
- We also offer an honors program in **mathematical sciences**.

## Emphasis 1. General (44-46 credits) Requirements in Department

MATH 229 - Calculus I  
 MATH 230 - Calculus II  
 MATH 232 - Calculus III  
 MATH 240 - Linear Algebra and Applications  
 MATH 336 - Ordinary Differential Equations  
 MATH 360 - Model Building in Applied Mathematics  
 MATH 420 - Abstract Algebra I  
 MATH 421 - Abstract Algebra II  
 OR MATH 423 - Linear and Multilinear Algebra  
 MATH 430 - Advanced Calculus I  
 MATH 431 - Advanced Calculus II  
 Two additional courses from MATH courses numbered above MATH 333 or STAT courses numbered above 299.  
 Requirement outside Department  
 CSCI 230 - Computer Programming in FORTRAN  
 OR CSCI 240 - Computer Programming in C++  
 Recommendations  
 MATH 440 - Elements of Complex Analysis  
 MATH 450 - Introduction to Topology  
 PHYS 253 - Fundamentals of Physics I: Mechanics

## Emphasis 2. Applied Mathematics (44-47 credits)

**Requirements in Department:**  
 MATH 229 - Calculus I  
 MATH 230 - Calculus II  
 MATH 232 - Calculus III  
 MATH 240 - Linear Algebra and Applications  
 MATH 336 - Ordinary Differential Equations  
 OR MATH 334 - Foundations of Applied Mathematics  
 MATH 360 - Model Building in Applied Mathematics  
 MATH 430 - Advanced Calculus I  
 MATH 431 - Advanced Calculus II  
 Two of the following:  
 MATH 420 - Abstract Algebra I  
 MATH 434 - Numerical Linear Algebra  
 MATH 435 - Numerical Analysis  
 MATH 438 - Theory of Differential Equations  
 MATH 439 - Applied Mathematics for Sciences and Engineering  
 OR MATH 442 - Elements of Partial Differential Equations

MATH 440 - Elements of Complex Analysis  
 MATH 444 - Linear Programming and Network Flows  
 MATH 460 - Modeling Dynamical Systems  
 STAT 400 - Probability  
 STAT 401 - Stochastic Processes  
 One additional MATH/STAT course numbered above MATH 333  
 Requirements outside Department  
 CSCI 230 - Computer Programming in FORTRAN  
 OR CSCI 240 - Computer Programming in C++  
 STAT 300 - Introduction to Probability and Statistics  
 Special Requirement: Students in this emphasis are required to complete a minor selected with the approval of the department.

## Emphasis 3. Computational Mathematics (44-45 credits)

**Requirements in Department:**  
 MATH 229 - Calculus I  
 MATH 230 - Calculus II  
 MATH 232 - Calculus III  
 MATH 240 - Linear Algebra and Applications  
 MATH 360 - Model Building in Applied Mathematics  
 MATH 420 - Abstract Algebra I  
 MATH 430 - Advanced Calculus I  
 MATH 434 - Numerical Linear Algebra  
 MATH 435 - Numerical Analysis  
 One of the following:  
 MATH 380 - Elementary Combinatorics  
 MATH 423 - Linear and Multilinear Algebra  
 MATH 440 - Elements of Complex Analysis  
 MATH 444 - Linear Programming and Network Flows  
 MATH 496 - Seminar in Computational Mathematics  
 STAT 435 - Applied Regression Analysis  
 Additional course  
 One additional course from:  
 CSCI 340 - Data Structures and Algorithm Analysis  
 CSCI 464 - Data Structures in Assembly Language  
 MATH/STAT courses numbered above 333  
 Requirements outside Department:  
 CSCI 230 - Computer Programming in FORTRAN  
 OR CSCI 240 - Computer Programming in C++  
 STAT 300 - Introduction to Probability and Statistics

## Contact Information

Department of Mathematical Sciences  
 Northern Illinois University  
 Watson Hall, room 320  
 815-753-0566

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

## What can I do with this degree?

In addition to preparing you for graduate degrees, there are numerous opportunities for those who hold a mathematics degree!

Applications Programmer  
 High school math teacher (9-12)  
 Computational Scientist  
 Computer Applications  
 Software Engineer  
 Computer Programmer  
 Computer Systems Analyst  
 Database Administrator  
 Operations Research Analyst  
 Systems Engineer  
 Applied Mathematician  
 Business Analyst  
 Communications Engineer  
 Economic Analyst  
 Investment Manager  
 Market Researcher  
 Product Developer  
 Biomathematician  
 Biomedical Engineer

## Emerging Fields

Computational Biology  
 Genomics  
 Data Mining  
 Neuroscience  
 Materials Science  
 Computer Animation  
 Digital Imaging



**Northern Illinois University**  
*Your Future. Our Focus.*