

# Bachelor of Science with Major in Mathematics

All students are encouraged to take courses in disciplines which make use of mathematics, such as Physics, Chemistry, Engineering, Computer Science, Biology, Economics, Cyber Security, and Data Science. Students considering graduate school in mathematics are strongly advised to take MATH 441 Abstract Algebra and MATH 432 Introduction to Analysis II.

Required 120 credits (36 of which must be numbered 300 or above, and 30 of which must be from UND) including:

I. Essential Studies Requirements (see University ES listing).

II. Non-Mathematics Requirements:

Computer Science course as approved by the Mathematics Department, such as CSCI 160 Computer Science I or other programming course.

III. The Following Curriculum of 38 Major Hours:

## A. Mathematics Core

Code	Title	Credits
MATH 165 & MATH 166 & MATH 265	Calculus I and Calculus II and Calculus III	12
MATH 207	Introduction to Linear Algebra	2
MATH 266	Elementary Differential Equations	3
MATH 330	Proof, Set Theory, and Logic	3
MATH 488	Senior Capstone	3
<b>Total Credits</b>		<b>23</b>

## B. Breadth Requirement

One course from each of the following areas (9)

1. *Theoretical Mathematics*: Courses where the emphasis is on development of theory from basic principles:

Code	Title	Credits
MATH 405	Selected Topics in Mathematics (pre-approval of topic required)	1-3
MATH 409	Geometry	3
MATH 431	Introduction to Analysis I	3
MATH 435	Theory of Numbers	3
MATH 441	Abstract Algebra	3
MATH 442	Linear Algebra	3

2. *Applications of Mathematics*: Courses where the emphasis is on applications of mathematics:

Code	Title	Credits
MATH 352	Introduction to Partial Differential Equations	3
MATH 355	Theory of Interest	3
MATH 408	Combinatorics	3
MATH 412	Differential Equations	3
MATH 415	Topics in Applied Mathematics	1-3
MATH 425	Cryptological Mathematics	3
MATH 455	Mathematics of Finance	3
MATH 460	Mathematical Modeling	3
MATH 461	Numerical Analysis	3
MATH 471	Introduction to Complex Variables	3

3. Probability and Statistics:

Code	Title	Credits
MATH 321	Applied Statistical Methods	3
MATH 416	Topics in Statistics	1-3
MATH 421	Statistical Theory I	3

## C. Depth Requirement

*Courses used to satisfy C may also be used to satisfy a portion of B.*

Code	Title	Credits
Select one of the following:		
MATH 352 & MATH 412	Introduction to Partial Differential Equations and Differential Equations	6
MATH 408 & MATH 425	Combinatorics and Cryptological Mathematics	
MATH 421 & MATH 422	Statistical Theory I and Statistical Theory II	
MATH 431 & MATH 432	Introduction to Analysis I and Introduction to Analysis II	
MATH 435 & MATH 441	Theory of Numbers and Abstract Algebra	
MATH 441 & MATH 442	Abstract Algebra and Linear Algebra	

## D. Electives

Math courses numbered 208 and above, excluding MATH 277 Mathematics for Elementary School Teachers, MATH 377 Geometry Elementary Teachers, MATH 399 Methods for Secondary Teachers: Mathematical Content Knowledge, MATH 477 Topics in Elementary School Mathematics (3-9 to bring the total number of credits to 38)

## Teacher Licensure

Through a partnership with the College of Education and Human Development and the Department of Teaching and Learning, students may seek secondary licensure in Mathematics. The following program of study must be completed:

I. Mathematics program of study

- The Essential Studies, Non-Mathematics, and Mathematics Core requirements as described above.
- The following courses to satisfy the breadth requirement:
  - Theoretical Mathematics*: *Math 409 Geometry*
  - Probability and Statistics*: MATH 321 Applied Statistical Methods
  - Teaching Content Requirements*: MATH 208 Discrete Mathematics, MATH 308 History of Mathematics
- The following sequence: MATH 435 Theory of Numbers & MATH 441 Abstract Algebra

II. Admission to the Secondary Program, normally while taking T&L 250 Introduction to Education. (See College of Education and Human Development (<https://education.und.edu/>) for admission and licensing requirements.)

III. The program in Secondary Education (see Teaching & Learning (<https://catalog.und.edu/undergraduateacademicinformation/departments/courses/programs/teachingandlearning/>)):

Mathematics majors seeking secondary licensure must have an advisor in both the Mathematics Department and the Department of Teaching and Learning.

## BS with Major in Mathematics with Emphasis in Actuarial Science

The following program of study must be completed.

I. The Essential Studies, Non-mathematics, and Core requirements of the BS with Major in Mathematics as described above.

II. Actuarial Sciences Program of Study:

Code	Title	Credits
MATH 355	Theory of Interest	3
MATH 455	Mathematics of Finance	3
MATH 421	Statistical Theory I	3
MATH 422	Statistical Theory II	3
MATH 442	Linear Algebra	3
ACCT 200	Elements of Accounting I	3
ACCT 201	Elements of Accounting II	3
ECON 201	Principles of Microeconomics	3
ECON 202	Principles of Macroeconomics	3
FIN 310	Principles of Financial Management	3