Mathematics

The mathematics major consists of a wide variety of mathematics course that prepare students for opportunities in the workforce as well as the potential for continued graduate study in mathematics, economics, and operations research.

Major Requirements

Major: Mathematics

Degree Type: B.A. or B.S.

Required Degree Credits to Graduate: 122

General Education Requirements

First Year Experience (F):

UNIV 189  
Skills For Academic Success (Students transferring in 24 or more credits do not need to take UNIV 189.)  
1

Communication (C):

ENGL 110  
College Composition I  
3

ENGL 120  
College Composition II  
3

One Course in Upper Level Writing: Select from current general education list  
3

COMM 110  
Fundamentals of Public Speaking  
3

Quantitative Reasoning (R):

MATH 165  
Calculus I  
4

Science & Technology (S):

A one-credit lab must be taken as a co-requisite with a general education science/technology course unless the course includes an embedded lab experience equivalent to a one-credit course. Select from current general education list  
10

Humanities & Fine Arts (A): Select from current general education list  
6

Social & Behavioral Sciences (B): Select from current general education list  
6

Wellness (W): Select from current general education list  
2

Cultural Diversity (D): Select from current general education list  

Global Perspectives (G): Select from current general education list  

Total Credits  
41

College Requirements

Bachelor of Science (BS) Degree – An additional 6 credits in Humanities or Social Sciences*

Bachelor of Arts (BA) Degree – An additional 12 credits Humanities and Social Sciences* and proficiency at the second year level in a modern foreign language.

* Humanities and Social Sciences may be fulfilled by any course having the following prefix: ADHM, ANTH, ARCH, ART, CJ, CLAS, COMM, ECON, ENGL, FREN, GEOG, GERM, HDFS, HIST, LA, LANG, MUSC, PHIL, POLS, PSYC, RELS, SOC, SPAN, THEA, WGS, or any course from the approved list of general education courses in humanities and social sciences (general education categories A and B). These credits must come from outside the department of the student’s major.

Major Requirements

A grade of ‘C’ or better is required in all MATH prefix courses.

General Education Requirements

<table>
<thead>
<tr>
<th>Mathematics Major Requirements</th>
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<tbody>
<tr>
<td><strong>MATH 165</strong></td>
<td>Calculus I (includes)</td>
</tr>
<tr>
<td><strong>MATH 166</strong></td>
<td>Calculus II</td>
</tr>
<tr>
<td><strong>MATH 265</strong></td>
<td>Calculus III</td>
</tr>
<tr>
<td><strong>MATH 266</strong></td>
<td>Introduction to Differential Equations</td>
</tr>
<tr>
<td><strong>MATH 270</strong></td>
<td>Introduction to Abstract Mathematics</td>
</tr>
<tr>
<td><strong>MATH 420</strong></td>
<td>Abstract Algebra I</td>
</tr>
<tr>
<td><strong>MATH 421</strong></td>
<td>Abstract Algebra II</td>
</tr>
<tr>
<td><strong>or MATH 451</strong></td>
<td>Real Analysis II</td>
</tr>
</tbody>
</table>

Total Credits  
40
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 429</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 450</td>
<td>Real Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 491</td>
<td>Seminar</td>
<td>2</td>
</tr>
</tbody>
</table>

**Electives**

Must choose one course from List A & one course from List B and must include one of the pairs of courses listed here: MATH 430/MATH 436; MATH 445/MATH 446; MATH 480/MATH 483; MATH 452/MATH 481; MATH 488/MATH 489; and (MATH 420/MATH 421 or MATH 450/MATH 451: whichever you didn't choose above)

**List A**

- MATH 374 Special Problems In Mathematics
- MATH 430 Graph Theory
- MATH 436 Combinatorics
- MATH 440 Axiomatic Geometry
- MATH 445 Differential Geometry
- MATH 446 Introduction to Topology
- MATH 452 Complex Analysis
- MATH 472 Number Theory

**List B**

- MATH 473 Cryptology
- MATH 480 Applied Differential Equations
- MATH 481 Fourier Analysis
- MATH 483 Partial Differential Equations
- MATH 488 Numerical Analysis I
- MATH 489 Numerical Analysis II
- STAT 467 Probability and Mathematical Statistics I
- CSCI 453 Linear Programming and Network Flows

**Related Required Courses**

- CSCI 160 Computer Science I 4

Lab Science Sequence: Choose one science lecture/lab sequence (A-F) OR the CSCI 161 & 2 CSCI electives (sequence G).

**Sequence A:**

- BIOL 150 General Biology I
- & 150L General Biology I Laboratory
- BIOL 151 General Biology II
- & 151L General Biology II Laboratory

**Sequence B:**

- BIOL 220 Human Anatomy and Physiology I
- & 220L Human Anatomy and Physiology I Laboratory
- BIOL 221 Human Anatomy and Physiology II
- & 221L Human Anatomy and Physiology II Laboratory

**Sequence C:**

- CHEM 121 General Chemistry I
- & 121L General Chemistry I Laboratory
- CHEM 122 General Chemistry II
- & 122L General Chemistry II Laboratory

**Sequence D:**

- CHEM 150 Principles of Chemistry I
- & CHEM 160 Principles of Chemistry Laboratory I
- CHEM 151 Principles of Chemistry II
- & CHEM 161 Principles of Chemistry Laboratory II

**Sequence E:**

- MICR 350 General Microbiology
- & 350L General Microbiology Lab
- MICR 352 General Microbiology II
- & 352L General Microbiology Lab II

**Sequence F:**
PHYS 251 & 251L  University Physics I and University Physics I Laboratory *

PHYS 252 & 252L  University Physics II and University Physics II Laboratory *

or Sequence G:

CSCI 161  Computer Science II

Select 2 of the following:

CSCI 345  Topics on Personal Computers
CSCI 372  Comparative Programming Languages
CSCI 458  Microcomputer Graphics

Degree Requirements: Potential of a minimum of 27 credits to reach 122

Total Credits 122-124

* Science and Technology General Education

Program Notes

• Except for courses offered only as pass/fail grading, no course may be taken Pass/Fail.

Minor Requirements

Mathematics Minor

Minor Requirements

Required Credits: 21

Required Courses

MATH 165  Calculus I  4
MATH 166  Calculus II  4
MATH 265  Calculus III  4

Electives

Approved electives for the mathematics minor include: MATH 266, MATH 270 & all 300-400 level MATH courses except for MATH 376. 9

Total Credits 21

Minor Requirements and Notes

• A minimum of 8 credits must be taken at NDSU.

• A grade of ‘C’ or better is required in all courses used toward this minor.