

# Mathematics and Statistics

## Mathematics and Statistics Double Major

### Pre-Actuarial Science Option

Actuarial Science is the study of the evaluation and measurement of risk. The Actuary Science option is a pre-professional program designed to provide the background needed to enter the field. Entrance into the profession is regulated under a system of examinations run by actuarial professional societies. The curriculum for this option is designed to prepare the student to pass several of these examinations.

The nature of the actuarial profession requires its practitioners to have a broad knowledge of finance, law, mathematics, management, and statistics. This option leads to a double major in Mathematics and Statistics with either a minor in Economics or additional courses in business. Students selecting this option are requested to visit with the actuarial advisers in both the Departments of Mathematics and Statistics early and often to confirm their progress and to inform themselves of changes in the examination curriculum.

## Major Requirements

### Major: Mathematics & Statistics

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

**Minimum Degree Credits to Graduate: 122**

### General Education Requirements for Baccalaureate Degree

- A dynamic list of approved general education courses offered by term is available on the NDSU General Education Requirements (<https://www.ndsu.edu/registrar/academics/gened>) website.
- General education courses may be used to satisfy requirements for both general education and the major, minor, and program emphases, where applicable. Students should carefully review the major, minor, and program emphases requirements for minimum grade restrictions, if applicable.

Code	Title	Credits
<b>First Year Experience (F)</b>		<b>1</b>
UNIV 189	Skills For Academic Success (Also offered with the following prefixes: ABEN, AGRI, BUSN, HD&E, ME, NURS, PHRM)	
<b>Communication (C)</b>		<b>12</b>
ENGL 110	College Composition I	
ENGL 120	College Composition II	
COMM 110	Fundamentals of Public Speaking	
	Upper Division Writing <sup>†</sup>	
<b>Quantitative Reasoning (R) <sup>†</sup></b>		<b>3</b>
<b>Science and Technology (S) <sup>†</sup></b>		<b>10</b>
<b>Humanities and Fine Arts (A) <sup>†</sup></b>		<b>6</b>
<b>Social and Behavioral Sciences (B) <sup>†</sup></b>		<b>6</b>
<b>Wellness (W) <sup>†</sup></b>		<b>2</b>
<b>Cultural Diversity (D) <sup>††</sup></b>		
<b>Global Perspectives (G) <sup>††</sup></b>		
<b>Total Credits</b>		<b>40</b>

\* May be satisfied by completing courses in another General Education category.

† May be satisfied with courses required in the major. Review major requirements to determine if a specific upper division writing course is required.

## College Requirements

Code	Title	Credits
	<b>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.</b>	<b>12</b>
	<b>Bachelor of Science (BS) Degree – An additional 6 credits in Humanities or Social Sciences *</b>	<b>6</b>

- \* 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.

## Mathematics & Statistics Major Requirements

A grade of 'C' or better is required in all MATH and STAT prefix courses.

Code	Title	Credits
<b>Math Major Core Requirements</b>		
MATH 129	Basic Linear Algebra	3
MATH 165	Calculus I (May satisfy general education category R)	4
MATH 166	Calculus II	4
MATH 265	Calculus III	4
MATH 266	Introduction to Differential Equations	3
MATH 270	Introduction to Abstract Mathematics	3
MATH 329	Intermediate Linear Algebra	3
MATH 346	Metric Space Topology	3
MATH 450	Real Analysis I	3
MATH 491	Seminar	2
Mathematics Electives	Any 300-400 level	3
<b>Statistics Major Requirements</b>		
STAT 330	Introductory Statistics	3
STAT 461	Applied Regression Models	3
STAT 462	Introduction to Experimental Design (Capstone)	3
STAT 467	Probability and Mathematical Statistics I	3
STAT 468	Probability and Mathematical Statistics II	3
Statistics Electives	400 level other than those listed above	18
<b>Related Required Courses:</b>		
CSCI 160	Computer Science I	4
CSCI 161	Computer Science II	4
<b>Total Credits</b>		<b>76</b>

## Major Requirements

### Major: Mathematics & Statistics Pre-Actuarial Option

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

Required Degree Credits to Graduate: 124

### General Education Requirements for Baccalaureate Degree

- A dynamic list of approved general education courses offered by term is available on the NDSU General Education Requirements (<https://www.ndsu.edu/registrar/academics/gened>) website.
- General education courses may be used to satisfy requirements for both general education and the major, minor, and program emphases, where applicable. Students should carefully review the major, minor, and program emphases requirements for minimum grade restrictions, if applicable.

Code	Title	Credits
<b>First Year Experience (F)</b>		<b>1</b>
UNIV 189	Skills For Academic Success (Also offered with the following prefixes: ABEN, AGRI, BUSN, HD&E, ME, NURS, PHRM)	
<b>Communication (C)</b>		<b>12</b>
ENGL 110	College Composition I	
ENGL 120	College Composition II	
COMM 110	Fundamentals of Public Speaking	
Upper Division Writing †		
<b>Quantitative Reasoning (R) †</b>		<b>3</b>

Science and Technology (S) <sup>†</sup>	10
Humanities and Fine Arts (A) <sup>†</sup>	6
Social and Behavioral Sciences (B) <sup>†</sup>	6
Wellness (W) <sup>†</sup>	2
Cultural Diversity (D) <sup>††</sup>	
Global Perspectives (G) <sup>††</sup>	
<b>Total Credits</b>	<b>40</b>

\* May be satisfied by completing courses in another General Education category.

† May be satisfied with courses required in the major. Review major requirements to determine if a specific upper division writing course is required.

## College Requirements

Code	Title	Credits
<b>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.</b>		12
<b>Bachelor of Science (BS) Degree – An additional 6 credits in Humanities or Social Sciences *</b>		6

\* 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 for all courses used toward the major.

Code	Title	Credits
<b>Science and Mathematics College Requirements</b>		6-12
<b>Math Major Requirements</b>		
MATH 129	Basic Linear Algebra	3
MATH 165	Calculus I (May satisfy general education category R)	4
MATH 166	Calculus II	4
MATH 265	Calculus III	4
MATH 266	Introduction to Differential Equations	3
MATH 270	Introduction to Abstract Mathematics	3
MATH 329	Intermediate Linear Algebra	3
MATH 346	Metric Space Topology	3
MATH 376	Actuarial Exam Study	1
MATH 450	Real Analysis I	3
Mathematics Elective	Any 300-400 level	3
<b>Statistics Major Requirements</b>		
STAT 330	Introductory Statistics	3
STAT 461	Applied Regression Models	3
STAT 462	Introduction to Experimental Design (Capstone)	3
STAT 467	Probability and Mathematical Statistics I	3
STAT 468	Probability and Mathematical Statistics II	3
STAT 476	Actuary Exam Study II	1
Statistics Electives	Courses must be at the 400 level and not listed above	9
<b>Related Required Courses</b>		
ACCT 200	Elements of Accounting I	3
ACCT 201	Elements of Accounting II	3
CSCI 160	Computer Science I	4
CSCI 161	Computer Science II	4
ECON 201	Principles of Microeconomics (May satisfy general education category B and G)	3

ECON 202	Principles of Macroeconomics (May satisfy general education category B and G)	3
Electives: Select three courses from the following:		9
CSCI 453	Linear Programming and Network Flows	
CSCI 454	Operations Research	
ECON 341	Intermediate Microeconomics	
ECON 343	Intermediate Macroeconomics	
ECON 410	Econometrics	
ECON 440	Game Theory and Strategy	
ECON 456	History of Economic Thought	
ECON 461	Economic Development	
ECON 465	Labor Economics	
ECON 470	Public Economics	
ECON 472	International Trade	
ECON 476	Monetary Theory and Policy	
ECON 480	Industrial Organization	
ECON 481	Natural Resource Economics	
ECON 482	Environmental Economics	
FIN 320	Principles of Finance	
FIN 410	Investment Analysis and Management	
FIN 420	Options, Futures, and Other Derivatives	
FIN 450	Money and Capital Markets	
FIN 460	Corporate Finance	

**Total Credits****94-100****Program Notes**

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