

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: 120

General Education Requirements for Baccalaureate Degree

- A list of approved general education courses is available here (<http://bulletin.ndsu.edu/past-bulletin-archive/2017-18/academic-policies/undergraduate-policies/general-education/#genedcoursestext>).
- 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, should they apply.

| Code | Title | Credits |
|--|---------------------------------|-----------|
| Communication (C) | | 12 |
| ENGL 110 | College Composition I | |
| ENGL 120 | College Composition II | |
| COMM 110 | Fundamentals of Public Speaking | |
| Upper Division Writing [†] | | |
| Quantitative Reasoning (R) [†] | | 3 |
| Science and Technology (S) [†] | | 10 |
| Humanities and Fine Arts (A) [†] | | 6 |
| Social and Behavioral Sciences (B) [†] | | 6 |
| Wellness (W) [†] | | 2 |
| Cultural Diversity (D) ^{**†} | | |
| Global Perspectives (G) ^{**†} | | |
| Total Credits | | 39 |

* 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 |
|---|-------|-----------|
| 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.* | | 12 |
| Bachelor of Science (BS) Degree – An additional 6 credits in Humanities or Social Sciences* | | 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.

Mathematics & Statistics Major Requirements

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

| Code | Title | Credits |
|--------------------------------------|---|---------|
| Math Major Core Requirements | | |
| 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 |
| Statistics Major Requirements | | |
| 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 |
| Related Required Courses: | | |
| CSCI 160 | Computer Science I | 4 |
| CSCI 161 | Computer Science II | 4 |
| Total Credits | | 76 |

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 list of approved general education courses is available here (<http://bulletin.ndsu.edu/past-bulletin-archive/2017-18/academic-policies/undergraduate-policies/general-education/#genedcoursestext>).
- 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, should they apply.

| Code | Title | Credits |
|--|---------------------------------|---------|
| Communication (C) | | 12 |
| ENGL 110 | College Composition I | |
| ENGL 120 | College Composition II | |
| COMM 110 | Fundamentals of Public Speaking | |
| Upper Division Writing [†] | | |
| Quantitative Reasoning (R) [†] | | 3 |
| Science and Technology (S) [†] | | 10 |
| Humanities and Fine Arts (A) [†] | | 6 |
| Social and Behavioral Sciences (B) [†] | | 6 |
| Wellness (W) [†] | | 2 |
| Cultural Diversity (D) ^{*†} | | |

Global Perspectives (G) ^{†}**

| | |
|---------------|----|
| Total Credits | 39 |
|---------------|----|

* 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 |
|--|-------|---------|
| 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. * | | 12 |
| Bachelor of Science (BS) Degree – An additional 6 credits in Humanities or Social Sciences * | | 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 |
|---|---|---------|
| Science and Mathematics College Requirements | | 6-12 |
| Math Major Requirements | | |
| 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 |
| Statistics Major Requirements | | |
| 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 |
| Related Required Courses | | |
| 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 | |

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|----------|---|
| 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.