School of Natural Sciences and Mathematics

Actuarial Science (B.S.)

The Actuarial Science program at UT Dallas is administered through the Department of Mathematics. Students receive a rigorous mathematical background including all the major courses taken by students majoring in mathematics or statistics. Further, ten courses devoted to finance, economics, applied statistics, insurance and actuarial science are required. Upon completion of this program, a student will have the knowledge and business background necessary to pursue a career as an actuary, as well as to undertake graduate study in actuarial science, statistics, mathematics, economics or finance.

Bachelor of Science in Actuarial Science

Degree Requirements (120 hours)

I. Core Curriculum Requirements\(^1\): 42 hours

Communication (6 hours)
- 3 hours Communication (RHET 1302)
- 3 hours Business Communication (BCOM 3311)

Social and Behavioral Sciences (15 hours)
- 6 hours Government (GOVT 2301 and GOVT 2302)
- 6 hours American History
- 3 hours Social and Behavioral Sciences Elective (ECON 2301)

Humanities and Fine Arts (6 hours)
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

Mathematics and Quantitative Reasoning (6 hours)
- 6 hours Calculus (MATH 2417 and MATH 2419)\(^2\)

Science with at least 1 hour of laboratory (9 hours)
- CHEM 1311/1111 General Chemistry I with Laboratory\(^3\)
- CHEM 1312/1112 General Chemistry II with Laboratory\(^4\)
- And an additional acceptable science course

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\(^1\) Includes an introduction to a foreign language.

\(^2\) Satisfies 4 hours of the Communication (RHET 1302) requirement.

\(^3\) Satisfies 3 hours of the Social and Behavioral Sciences (GOVT 2301) requirement.

\(^4\) Satisfies 3 hours of the Social and Behavioral Sciences (GOVT 2302) requirement.
II. Major Requirements\textsuperscript{5}: 66 hours

**Major Preparatory Courses (21 hours)**
- **ACCT 2301** Introductory Financial Accounting
- **CS 1337**\textsuperscript{6} Computer Science I
- **ECON 2302** Principles of Microeconomics
- **MATH 2418**\textsuperscript{6} Linear Algebra
- **MATH 2420**\textsuperscript{6} Differential Equations with Applications
- **MATH 2451**\textsuperscript{6} Multivariable Calculus with Applications

**Major Core Courses (45 hours)**
- **ACTS 4301** Principles of Actuarial Models: Life Contingencies I
- **ACTS 4302** Principles of Actuarial Models: Financial Economics
- **ACTS 4303** Principles of Actuarial Models: Life Contingencies II
- **ACTS 4304** Construction and Evaluation of Actuarial Models
- **ACTS 4308** Actuarial Financial Mathematics
- **FIN 3320** Business Finance
- **FIN 3370** Insurance and Risk Management
- **MATH 3310** Theoretical Concepts of Calculus
- **MATH 3311** Abstract Algebra I
- **MATH 3379** Complex Variables
- **MATH 4334** Numerical Analysis
- **STAT 3355** Data Analysis for Statisticians and Actuaries
- **STAT 4351** Probability
- **STAT 4352** Mathematical Statistics
- **MATH 4301** Mathematical Analysis I

III. Elective Requirements: 12 hours

Both lower- and upper-division courses may count as electives, but the student must complete at least 51 hours of upper-division credit to qualify for graduation. Students must choose two of the following courses:
- **ACTS 4306** Actuarial Probability as Problem Solving
- **STAT 4382** Stochastic Processes
- **MATH 4302** Mathematical Analysis II
- **FIN 4300** Investment Management

\textsuperscript{5}III. Elective Requirements: 12 hours

Both lower- and upper-division courses may count as electives, but the student must complete at least 51 hours of upper-division credit to qualify for graduation. Students must choose two of the following courses:

- **ACTS 4306** Actuarial Probability as Problem Solving
- **STAT 4382** Stochastic Processes
- **MATH 4302** Mathematical Analysis II
- **FIN 4300** Investment Management
ACCT 2302 Introductory Management Accounting
ACCT 3331 Intermediate Financial Accounting I
MIS 3300 Introduction to Management Information Systems
FIN 3390 Introduction to Financial Modeling
FIN 3350 Financial Markets and Institutions
FIN 4310 Applied Corporate Finance
FIN 4340 Options and Futures Markets
FIN 3330 Personal Financial Planning
ECON 4330 Law and Economics

All students are required to take at least six hours of advanced electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.

Preparation for Actuarial Exams

Exam 1: STAT 4351 and ACTS 4306
Exam 2: ACTS 4308, FIN 3320, and FIN 4300
Exam 3: Life Contingencies part: ACTS 4301, ACTS 4303
Exam 3: Financial Economics part: ACTS 4302
Exam 4: ACTS 4304

Validation by Educational Experience (VEE) Credits

Applied Statistical Methods: STAT 3355 and STAT 4382
Corporate Finance: FIN 3320
Economics: ECON 2301 and ECON 2302

Minor in Actuarial Science

The Minor in Actuarial Science program at UT Dallas is administered through the Department of Mathematical Sciences. It is ideal for students who are interested in broadening their experience and knowledge base in the study and analysis of principles of Actuarial Science. The minor core courses prepare students for a number of actuarial exams required for a designation of Associate of the Society of Actuaries, Casualty Actuarial Society, or Canadian Institute of Actuaries. Specifically, the minor provides students with an intense background in principles of actuarial models. All of the courses in the minor serve as starting points for learning the concepts covered on the preliminary actuarial exams (P/1, FM/2, MLC/3L).

Students not majoring in Actuarial Science may obtain a minor in Actuarial Science by satisfying 24 semester credit hours (9 semester credit hours of minor core courses and 15 semester credit hours of minor preparatory courses).

Minor Preparatory Courses (15 hours)

MATH 2417 Calculus I (Differential Calculus)
MATH 2419 Calculus II (Integral Calculus)
MATH 2451 Multivariable Calculus with Applications

MIS 3300 Introduction to Management Information Systems

Minor Core Courses (9 hours)\(^8\)

STAT 4351 Probability

ACTS 4301 Principles of Actuarial Models: Life Contingencies I

ACTS 4308 Actuarial Financial Mathematics

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parenthesis are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. Students may choose one of the following calculus sequences: (a) MATH 2413, MATH 2414, and MATH 2415; or (b) MATH 2417 and MATH 2419.

3. Students may choose a Physics sequence instead of Chemistry: PHYS 2325/2125 Mechanics with Laboratory or PHYS 2421/2125 Honors Physics I - Mechanics and Heat with Laboratory.

4. Students may choose a Physics sequence instead of Chemistry: PHYS 2326/2126 Electromagnetism and Waves with Laboratory or PHYS 2422/2126 Honors Physics II - Electromagnetism and Waves with Laboratory.

5. A required Major course that also fulfills Core Curriculum requirements. If hours are counted in the Core Curriculum, students must complete additional coursework to meet the minimum requirement for graduation. Course selection assistance is available from the undergraduate advisor.

6. Indicates a prerequisite class to be completed before enrolling for upper-division classes.

7. Students whose major does not require MATH 2417 and MATH 2419 as part of their Mathematics and Quantitative Reasoning Core Curriculum Requirements, should take this sequence as their core curriculum courses to ensure efficiency toward the minor.

8. These classes prepare for the three preliminary actuarial examinations jointly administered by the Society of Actuaries (SOA), Casualty Actuarial Society (CAS) and the Canadian Institute of Actuaries (CIA).