School of Natural Sciences and Mathematics

Actuarial Science (BS)

The Bachelor of Science Actuarial Science (AS) Program at The University of Texas at Dallas is administered through the Department of Mathematical Sciences. 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, accounting, applied statistics, information technology and actuarial science are required. All students are prepared to take three actuarial preliminary exams (Probability - P/1, Financial Mathematics - FM/2, Models in Financial Economics- MFE/3F) and achieve Validation of Educational Experience (VEE) credits in applied statistical methods, economics, and corporate finance. Students also receive rigorous instruction in preparation for a major part of the two additional actuarial preliminary exams (Models in Life Contingencies - MLC/LC and Construction and Evaluation of Actuarial Models - C/4) as well as for the two CAS Exams (Stochastic Processes/Statistics - ST and Statistics and Probabilistic Models - S). 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 semester credit hours)\(^1\)

View an Example of Degree Requirements by Semester

Faculty


Professors Emeritus: Patrick Odell, John W. Van Ness

Clinical Professors: Natalia Humphreys, Wenyi (Roy) Lu

Associate Professors: Yan Cao, Min Chen

Assistant Professors: Mohammad Akbar, Maxim Arnold, Carlos Arreche, Bhargab Chattopadhyay, Sy Han (Steven) Chiou, Qingwen Hu, Frank Koniechschke, Yifei Lou, Oleg Makarenkov, Tomoki Ohsawa, Sunyoung Shin, Anh Tran, Nathan Williams

Senior Lecturers: Mohammad Ahsan, Kelly Aman, Malgorzata Dabkowska, Rabin Dahal, Anatoly Eydelzon, Manjula Foley, Bentley T. Garrett, Farid Khafizov, Yuly Koshevnik, David L. Lewis, Changsong Li, Brady McCary, Derege Mussa, My Linh Nguyen, Jigarkumar Patel, Paul Stanford, Julie Sutton, Tristan Whalen

UT Dallas Affiliated Faculty: Hervé Abdi, Titu Andreescu, Alain Bensoussan, Stefano Leonardi, Faruck Mocrós, John J. Wiorkowski, Zhenyu Xuan, Hyuntae Yoo, Michael Qiwei Zhang

I. Core Curriculum Requirements: 42 semester credit hours\(^2\)
Communication: 6 semester credit hours

COMM 1311  Survey of Oral and Technology-based Communication
RHET 1302  Rhetoric

Mathematics: 3 semester credit hours

MATH 2417  Calculus I\(^3\),\(^4\),\(^5\)

Life and Physical Sciences: 6 semester credit hours\(^3\),\(^6\)

PHYS 2325  Mechanics

or PHYS 2421  Honors Physics I - Mechanics and Heat\(^7\)

or CHEM 1311  General Chemistry I

or CHEM 1315  Honors Freshman Chemistry I

PHYS 2326  Electromagnetism and Waves

or PHYS 2422  Honors Physics II - Electromagnetism and Waves\(^7\)

or CHEM 1312  General Chemistry II

or CHEM 1316  Honors Freshman Chemistry II

Language, Philosophy and Culture: 3 semester credit hours

HUMA 1301  Exploration of the Humanities

Creative Arts: 3 semester credit hours

ARTS 1301  Exploration of the Arts

American History: 6 semester credit hours

HIST 1301  U.S. History Survey to Civil War
HIST 1302  U.S. History Survey from Civil War

Government / Political Science (6 semester credit hours)

GOVT 2305  American National Government
GOVT 2306  State and Local Government

Social and Behavioral Sciences: 3 semester credit hours

ECON 2302  Principles of Microeconomics\(^3\)

Component Area Option: 6 semester credit hours

MATH 2417  Calculus I\(^3\),\(^4\),\(^5\)
MATH 2419  Calculus II\(^3\),\(^4\),\(^5\)
PHYS 2125  Physics Laboratory $^{3,6}$

or CHEM 1111  General Chemistry I Laboratory$^{3,6}$

II. Major Requirements: 76-78 semester credit hours

Major Preparatory Courses: 31-33 semester credit hours beyond Core Curriculum

ACCT 2301  Introductory Financial Accounting
ACCT 2302  Introductory Management Accounting
BCOM 3200  Introduction to Business Professional Development and Business Communication$^{7}$
BCOM 3310  Business Communication
CS 1336  Programming Fundamentals
CS 1136  Computer Science Laboratory
CS 1337  Computer Science I

or MATH 2370  Introduction to Programming with MATLAB$^{8}$

ECON 2302  Principles of Microeconomics
MATH 2417  Calculus I$^{3,4,5}$
MATH 2419  Calculus II$^{3,4,5}$
MATH 2418  Linear Algebra
MATH 2420  Differential Equations with Applications
MATH 2451  Multivariable Calculus with Applications$^{9}$

PHYS 2325  Mechanics$^{3,6}$

or PHYS 2421  Honors Physics I - Mechanics and Heat$^{3,6,7}$

or CHEM 1311  General Chemistry I$^{3,6}$

or CHEM 1315  Honors Freshman Chemistry I$^{3,6}$

PHYS 2326  Electromagnetism and Waves$^{3,6}$

or PHYS 2422  Honors Physics II - Electromagnetism and Waves$^{3,6,7}$

or CHEM 1312  General Chemistry II$^{3,6}$

or CHEM 1316  Honors Freshman Chemistry II$^{3,6}$

PHYS 2125  Mechanics Laboratory$^{3,6}$

or CHEM 1111  General Chemistry I Laboratory$^{3,6}$

or CHEM 1115  Honors Freshman Chemistry Laboratory I

PHYS 2126  Electromagnetism and Waves Laboratory

or CHEM 1112  General Chemistry II Laboratory
or **CHEM 1116** Honors Freshman Chemistry Laboratory II

**Major Core Courses: 45 semester credit hours**

- **ACTS 4301** Principles of Actuarial Models: Life Contingencies I
- **ACTS 4302** Principles of Actuarial Models: Financial Economics
- **ACTS 4304** Construction and Evaluation of Actuarial Models
- **ACTS 4308** Actuarial Financial Mathematics
- **FIN 3320** Business Finance
- **MATH 3310** Theoretical Concepts of Calculus
- **MATH 3311** Abstract Algebra I
- **MATH 3379** Complex Variables
- **MATH 4334** Numerical Analysis
- **ITSS 3300** Information Technology for Business
- **ITSS 4301** Database Systems
- **STAT 3355** Data Analysis for Statisticians and Actuaries
- **STAT 4351** Probability
- **STAT 4352** Mathematical Statistics
- **STAT 4382** Stochastic Processes

**III. Elective Requirements: 0-2 semester credit hour**

Freshman students are required to take **UNIV 1010**.

**Preparation for Actuarial Exams**

- Exam 1/P: **STAT 4351** or **ACTS 4306**
- Exam 2/FM: **ACTS 4308**, **FIN 3320**
- Exam 3L/MLC: **ACTS 4301**
- Exam 3F/MFE: **ACTS 4302**
- Exam 4/C: **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**

**Fast Track Baccalaureate/Master’s Degrees**

In response to the need for post-baccalaureate education, a Fast Track program is available to well-qualified UT Dallas undergraduate students. Qualified seniors may take up to 15 graduate semester credit hours that may be used to complete the baccalaureate degree and also to satisfy the requirements for the master's degree. Interested students should see the Associate Dean of Undergraduate Education (ADU) for specific
requirements.

1. Incoming freshmen must enroll and complete requirements of UNIV 1010 and the corresponding school-related freshman seminar course. Students, including transfer students, who complete their core curriculum at UT Dallas must take UNIV 2020.

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

3. A required Major preparatory course that also fulfills a Core Curriculum requirement. Semester credit hours are counted in Core Curriculum.

4. Three semester credit hours of Calculus are counted to fulfill the Mathematics Core Requirement with the remaining one semester credit hour to be counted under Component Area Option Core Requirement.

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

6. Six semester credit hours of Physics or Chemistry are counted under Science core, and one semester credit hour of Physics or Chemistry (PHYS 2125 or CHEM 1111) are counted under Component Area Option core.

7. Please consult your advisor if selecting Honors Physics or if you have taken BA 1100.

8. MATH 2370 will provide a better preparation for MATH 4334 Numerical Analysis course.

9. MATH 2451 may be taken in the Summer if offered.