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)

View an Example of Degree Requirements by Semester

Faculty

**Professors:** Larry P. Ammann, Zalman I. Balanov, Pankaj K. Choudhary, Mieczyslaw K. Dabkowski, Vladimir Dragovic, Sam Efremovich, Yulia Gel, M. Ali Hooshyar, Wieslaw Krawcewicz, Susan E. Minkoff, L. Felipe Pereira, Dmitry Rachinskiy, Viswanath Ramakrishna, Janos Turi, John Zweck

**Professors Emeritus:** Patrick Odell, John W. Van Ness

**Clinical Professors:** Natalia Humphreys, Wenyi (Roy) Lu

**Associate Professors:** Swati Biswas, Yan Cao, Min Chen

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

**Senior Lecturers:** Mohammad Ahsan, Kelly Aman, Malgorzata Dabkowska, Rabin Dahal, Anatoly
I. Core Curriculum Requirements: 42 semester credit hours²

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 ¹, ², ³, ⁴, ⁵

Life and Physical Sciences: 6 semester credit hours³, ⁶

PHYS 2325  Mechanics
   or PHYS 2421  Honors Physics I - Mechanics and Heat⁷
   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 Waves⁷
   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

Component Area Option: 6 semester credit hours
MATH 2417 Calculus I
MATH 2419 Calculus II
PHYS 2125 Physics Laboratory
or CHEM 1111 General Chemistry I Laboratory

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
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
ECON 2302 Principles of Microeconomics
MATH 2417 Calculus I
MATH 2419 Calculus II
MATH 2418 Linear Algebra
MATH 2420 Differential Equations with Applications
MATH 2451 Multivariable Calculus with Applications
PHYS 2325 Mechanics
or PHYS 2421 Honors Physics I - Mechanics and Heat
or CHEM 1311 General Chemistry I
or **CHEM 1315** Honors Freshman Chemistry \( ^3 \), \( ^6 \)

**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.