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 rigorous mathematical background including all the major courses taken by students majoring in mathematics or statistics. Further, a number of courses devoted to computer science, finance, economics, accounting, statistics, insurance, information technology and actuarial science are required. All students are prepared to take four actuarial preliminary exams (Probability - P/1, Financial Mathematics - FM/2, Investment and Financial Markets - IFM/3F, Statistics for Risk Modeling - SRM) and achieve Validation of Educational Experience (VEE) credits in accounting and corporate finance, economics, and mathematical statistics. Students also receive rigorous instruction in preparation for a major part of the two additional actuarial preliminary exams (Long Term Actuarial Mathematics - LTAM/LC and Short Term Actuarial Mathematics - STAM/4) as well as for the two CAS Exams (Modern Actuarial Statistics I and II - MAS I and MAS II). 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:** Larry P. Ammann, Zalman I. Balanov, Swati Biswas, Pankaj K. Choudhary, Mieczyslaw K. Dabkowski, Vladimir Dragovic, Sam Efroimovich, 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:** Yan Cao, Min Chen

**Clinical Associate Professor:** Mohammad Akbar

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

**Associate Professor of Instruction:** My Linh Nguyen

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

**UT Dallas Affiliated Faculty:** Hervé Abdi, Titu Andreescu, Alain Bensoussan, Stefano Leonardi, Faruck Morcos, Zhenyu Xuan, Hyuntae Yoo, Michael Qiwei Zhang
I. Core Curriculum Requirements: 42 semester credit hours

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, II, III

Life and Physical Sciences: 6 semester credit hours

   PHYS 2325 Mechanics
   or PHYS 2421 Honors Physics I - Mechanics and Heat
   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
   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, II, III
II. Major Requirements: 76-77 semester credit hours

Major Preparatory Courses: 31-32 semester credit hours beyond Core Curriculum

ACCT 2301 Introductory Financial Accounting
ACCT 2302 Introductory Management Accounting
BCOM 3200 Introduction to Business and Professional Development
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 2420 Differential Equations with Applications
MATH 2418 Linear Algebra
MATH 2451 Multivariable Calculus with Applications
PHYS 2325 Mechanics and PHYS 2125 Physics Laboratory
  or PHYS 2421 Honors Physics I - Mechanics and Heat
  or CHEM 1311 General Chemistry I and CHEM 1111 General Chemistry Laboratory
  or CHEM 1315 Honors Freshman Chemistry I and CHEM 1115 Honors Freshman Chemistry Laboratory I
PHYS 2326 Electromagnetism and Waves
  or PHYS 2422 Honors Physics II - Electromagnetism and Waves
  or CHEM 1312 General Chemistry II
  or CHEM 1316 Honors Freshman Chemistry II
PHYS 2126 Physics Laboratory II
  or CHEM 1112 General Chemistry Laboratory II
or **CHEM 1116** Honors Freshman Chemistry Laboratory II

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

- **ACTS 4301** Long Term Actuarial Mathematics I
- **ACTS 4302** Investment and Financial Markets I
- **ACTS 4303** Long Term Actuarial Mathematics II
- **ACTS 4304** Short Term Actuarial Mathematics I
- **ACTS 4305** Short Term Actuarial Mathematics II
- **ACTS 4307** Statistics for Risk Modeling
- **ACTS 4308** Actuarial Financial Mathematics
- **ACTS 4309** Investment and Financial Markets II
- **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: 1-2 semester credit hour**

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

- **RMIS 3370** Principles of Risk Management and Insurance
- **RMIS 4331** Business Liability Risk Management and Insurance
- **MATH 3310** Theoretical Concepts of Calculus
- **MATH 3311** Abstract Algebra I
- **MATH 3379** Complex Variables

**Preparation for Actuarial Exams**

- **Exam 1/P:** **STAT 4351**
- **Exam 2/FM:** **ACTS 4308**
- **Exam 3L/LTAM:** **ACTS 4301** and **ACTS 4303**
- **Exam 3F/IFM:** **ACTS 4302** and **ACTS 4309**
- **Exam 4/STAM:** **ACTS 4304** and **ACTS 4305**
- **Exam SRM:** **ACTS 4307**

**Validation by Educational Experience (VEE) Credits**

- **Mathematical Statistics:** **STAT 3355** and **STAT 4352**
Accounting and Corporate Finance: ACCT 2302 and ACTS 4302
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. Students may use three semester credit hours of PHYS 2421 to count under Science core, and one semester credit hour of PHYS 2421 under Component Area Option core.
9. MATH 2370 will provide a better preparation for MATH 4334 Numerical Analysis course.
10. MATH 2451 may be taken in the Summer if offered.
11. Students who complete PHYS 2421 do not need to complete PHYS 2125.

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