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 well-rounded actuarial education with a strong foundation in mathematics, statistics, computer and data science, economics, and finance. All students are prepared to take seven actuarial preliminary Society of Actuaries (SOA) exams: Probability - P/1, Financial Mathematics - FM/2, Fundamentals of Actuarial Mathematics - FAM, Advanced Short Term Actuarial Mathematics - ASTAM, Advanced Long Term Actuarial Mathematics - ALTAM, Statistics for Risk Modeling - SRM, Predictive Analytics - PA. Students achieve Validation of Educational Experience (VEE) credits in Accounting and Finance, Economics, and Mathematical Statistics. Students also receive rigorous instruction in preparation for a major part of the three Casualty Actuarial Society (CAS) Exams: Actuarial Models: Financial Economics - 3F, Modern Actuarial Statistics I and II - MAS I and MAS II. Upon completion of this program, students will have the knowledge and business background necessary to pursue a career as actuaries, as well as to undertake graduate study in actuarial science, statistics, mathematics, economics, data science or finance.

Bachelor of Science in Actuarial Science

Degree Requirements (120 semester credit hours)

View an Example of Degree Requirements by Semester

Faculty

Professors: Zalman I. Balanov, Swati Biswas, Min Chen, Pankaj K. Choudhary, Baris Coskunuzer, Mieczyslaw K. Dabkowski, Vladimir Dragovic, Sam Efromovich, Yulia Gel, Wieslaw Krawcewicz, Susan E. Minkoff, L. Felipe Pereira, Dmitry Rachinskiy, Viswanath Ramakrishna, Janos Turi, John Zweck

Associate Professors: Maxim Arnold, Yan Cao, Liang Hong, Yifei Lou, Oleg Makarenkov, Tomoki Ohsawa, Anh Tran

Assistant Professors: Carlos Arreche, Sy Han (Steven) Chiou, Ronan Conlon, Qiwei Li, Stephen McKeown, Sunyoung Shin, Chuan-Fa Tang, Nathan Williams, Yunan Wu

Professors Emeriti: Larry P. Ammann, M. Ali Hooshyar, Patrick Odell, John W. Van Ness

Clinical Professor: Natalia Humphreys

Clinical Associate Professor: Mohammad Akbar

Clinical Assistant Professor: Wenyi (Roy) Lu
Associate Professors of Instruction: Mohammad Ahsan, Kelly Aman, Malgorzata Dabkowska, Rabin Dahal, Changsong Li, Derege Mussa, My Linh Nguyen, Jigarkumar Patel, Julie Sutton, Tristan Whalen

Assistant Professors of Instruction: Anani Komla Adabrah, Iris Alvarado, Hui Ding, Adannah Duruoha, Kemelli Estacio-Hiroms, Huizhen Guo, Neha Makhijani, Ajaya Paudel, Nasrin Sultana, Kristen Wetzler

Senior Lecturers: Irina Martynova, Brady McCary

UT Dallas Affiliated Faculty: Hervé Abdi, Titu Andreescu, Alain Bensoussan, Stefano Leonardi, Faruck Morcos, Zhenyu Xuan, 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

Or select any 6 semester credit hours from Communication Core courses (see advisor)

Mathematics: 3 semester credit hours

MATH 2417 Calculus 1

Or select any 3 semester credit hours from Mathematics Core courses (see advisor)

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

Or select any 6 semester credit hours from Life and Physical Sciences Core courses (see advisor)

Language, Philosophy and Culture: 3 semester credit hours

Select any 3 semester credit hours from Language, Philosophy and Culture Core courses (see advisor)

Creative Arts: 3 semester credit hours
Select any 3 semester credit hours from Creative Arts Core courses (see advisor)

American History: 6 semester credit hours

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

Or select any 6 semester credit hours from American History Core courses (see advisor)

Government/Political Science: 6 semester credit hours

- **GOVT 2305** American National Government
- **GOVT 2306** State and Local Government

Or select any 6 semester credit hours from Government/Political Science Core courses (see advisor)

Social and Behavioral Sciences: 3 semester credit hours

- **ECON 2302** Principles of Microeconomics

Or select any 3 semester credit hours from Social and Behavioral Sciences Core courses (see advisor)

Component Area Option: 6 semester credit hours

- **MATH 2417** Calculus I
- **MATH 2419** Calculus II
- **PHYS 2125** Physics Laboratory
  - or **PHYS 2421** Honors Physics I - Mechanics and Heat
  - or **CHEM 1111** General Chemistry Laboratory

Or select any 6 semester credit hours from Component Area Option courses (see advisor)

II. Major Requirements: 77-78 semester credit hours

Major Preparatory Courses: 29-30 semester credit hours beyond Core Curriculum

- **UNIV 1010** Comets to the Core Pre-Assessment
- **NATS 1101** Natural Sciences and Mathematics Freshman Seminar
- **ACCT 2301** Introductory Financial Accounting
- **ACCT 2302** Introductory Management Accounting
- **BCOM 3300** Professionalism and Communication in Business
- **CS 1336** Programming Fundamentals
CS 1136 Computer Science Laboratory
CS 1337 Computer Science I
   or MATH 2370 Introduction to Programming with MATLAB$^9$
ECON 2301 Principles of Macroeconomics
ECON 2302 Principles of Microeconomics
MATH 2417 Calculus I$^3, 4, 5$
MATH 2418 Linear Algebra
MATH 2419 Calculus II$^3, 4, 5$
MATH 2420 Differential Equations with Applications
PHYS 2325 Mechanics$^3, 6$ and PHYS 2125 Physics Laboratory I$^3, 6$
   or PHYS 2421 Honors Physics I - Mechanics and Heat$^3, 7, 8, 10$
   or CHEM 1311 General Chemistry I$^3, 6$ and CHEM 1111 General Chemistry Laboratory I$^3, 6$
   or CHEM 1315 Honors Freshman Chemistry I$^3, 6$ and CHEM 1115 Honors Freshman Chemistry Laboratory I
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 2126 Physics Laboratory II
   or CHEM 1112 General Chemistry Laboratory II
   or CHEM 1116 Honors Freshman Chemistry Laboratory II

Major Core Courses: 48 semester credit hours

ACTS 4301 Long Term Actuarial Mathematics I
ACTS 4302 Investment and Financial Markets
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 Theory of Options
ACTS 4310 Predictive Analytics
**MATH 3351** Advanced Calculus

**ITSS 3300** Information Technology for Business

**ITSS 4301** Database Systems

**STAT 3355** Introduction to Data Analysis

**STAT 4351** Probability

**STAT 4352** Mathematical Statistics

**STAT 4382** Stochastic Processes

### III. Elective Requirements: 0-1 semester credit hour

- **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
- **MATH 4334** Numerical Analysis

### Preparation for Actuarial Exams

- Exam 1/P: **STAT 4351**
- Exam 2/FM: **ACTS 4308**
- Exams 3L/FAM/ALTAM: **ACTS 4301** and **ACTS 4303**
- Exams 3F/ALTAM/ FAP modules: **ACTS 4302** and **ACTS 4309**
- Exams 4/FAM/ASTAM: **ACTS 4304** and **ACTS 4305**
- Exam SRM: **ACTS 4307**
- Exam PA: ACTS 4310

### 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 institutions of higher education. The courses listed 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.

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 basic knowledge of a programming and numeric computing platform MATLAB and a better preparation for MATH 4334 Numerical Analysis course if elected.

10. Students who complete PHYS 2421 do not need to complete PHYS 2125.