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)*

*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 Efremovich, Yulia Gel, M. Ali Hooshyar, 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, 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, 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, Julie Sutton, 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, 4, 5
Or select any 3 semester credit hours from Mathematics Core courses (see advisor)

Life and Physical Sciences: 6 semester credit hours3, 6

PHYS 2325 Mechanics
  or PHYS 2421 Honors Physics I - Mechanics and Heat7, 8
  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
Or select any 6 semester credit hours from Life and Physical Sciences Core courses (see advisor)

Language, Philosophy and Culture: 3 semester credit hours

HUMA 1301 Exploration of the Humanities
Or select any 3 semester credit hours from Language, Philosophy and Culture Core courses (see
advisor)

Creative Arts: 3 semester credit hours

**ARTS 1301** Exploration of the Arts

Or 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** Freshman Seminar

**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\(^3\)

**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 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
II. Required Courses: 32 semester credit hours

- **ACTS 4308** Actuarial Financial Mathematics
- **ACTS 4309** Investment and Financial Markets II
- **MATH 3351** Advanced Calculus
- **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: 0-1 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

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.

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