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

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

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

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

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

**Clinical Associate Professor:** Mohammad Akbar
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

**MATH 2419** Calculus II

**PHYS 2125** Physics Laboratory

or **PHYS 2421** Honors Physics I - Mechanics and Heat

or **CHEM 1111** General Chemistry Laboratory

II. Major Requirements: 77-79 semester credit hours

Major Preparatory Courses: 32-34 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

**ECON 2301** Principles of Macroeconomics

**ECON 2302** Principles of Microeconomics

**MATH 2417** Calculus I

**MATH 2418** Linear Algebra

**MATH 2419** Calculus II

**MATH 2420** Differential Equations with Applications
MATH 2451  Multivariable Calculus with Applications
or MATH 3351  Advanced Calculus

PHYS 2325  Mechanics and PHYS 2125  Physics Laboratory

PHYS 2421  Honors Physics I - Mechanics and Heat

CHEM 1311  General Chemistry I and CHEM 1111  General Chemistry Laboratory I

CHEM 1315  Honors Freshman Chemistry I and CHEM 1115  Honors Freshman Chemistry Laboratory I

PHYS 2326  Electromagnetism and Waves

PHYS 2422  Honors Physics II - Electromagnetism and Waves

CHEM 1312  General Chemistry II

CHEM 1316  Honors Freshman Chemistry II

PHYS 2126  Physics Laboratory II

CHEM 1112  General Chemistry Laboratory II

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: 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 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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