School of Natural Sciences and Mathematics

Mathematics (BS)

Mathematics is both a profession and an indispensable tool for many types of work. As a tool, mathematics is a universal language that has been crucial in formulating and expressing ideas not only in science and engineering, but also in many other areas such as business and the social sciences. As probably the oldest and most basic science, it provides the key to understanding the major technological achievements of our time.

Of equal importance, knowledge of mathematics may help provide a student with the type of uncompromising and clear-sighted thinking useful in considering the problems of many other disciplines. The Mathematics degree program encompasses mathematics, statistics, and applied mathematics. The Mathematical Sciences Department also administers a Bachelor of Science in Actuarial Science.

Those interested in obtaining both a BS in Mathematics and Teacher Certification in the state of Texas should consult the Teacher Development Center or UTeach Dallas office for specific requirements as soon as possible after formal admission to the University. See the Teacher Education Certification Programs section of the catalog for additional information.

The Mathematics degree program also prepares students for graduate studies. An accelerated BS/MS Fast Track program is available which provides the opportunity for undergraduate students to satisfy some of the requirements of the master's degree while they are completing the bachelor's degree in Mathematics.

The Program in Mathematics

Students seeking a degree in Mathematics may specialize in Mathematics, Statistics, or Applied Mathematics, and receive a BS degree. Each specialization allows some flexibility in electives so that students can better adapt their degree plans to their educational goals.

Mathematics Specialization: For students interested in a career in mathematics and for students interested in continuing on to graduate work in mathematics, applied mathematics, math education, and related areas.

Statistics Specialization: For students interested in probability and statistical models and their use in data analysis and decision-making and for students interested in continuing on to graduate work in statistics, biostatistics, actuarial science, and other statistics related areas.

Applied Mathematics Specialization: For students interested in mathematics for the purpose of

using it broadly in various areas of application and for students interested in continuing on to graduate work in applied mathematics and related areas.

Bachelor of Science in Mathematics

Degree Requirements (120 semester credit hours)[1]

All majors with specialization in either Mathematics or Statistics are strongly urged to meet with assigned departmental advisors every semester.

Faculty

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Professors: Larry P. Ammann, Zalman I. Balanov, Vladimir Dragovic, Sam Efromovich, M. Ali Hooshyar, Wieslaw Krawcewicz, Susan E. Minkoff, L. Felipe Pereira, Dmitry Rachinskiy, Viswanath Ramakrishna, Robert Serfling, Janos Turi, John Zweck

Professors Emeritus: Patrick Odell, Ivor Robinson, John W. Van Ness

Clinical Professors: Natalia Humphreys

Associate Professors: Swati Biswas, Yan Cao, Pankaj K. Choudhary, Mieczyslaw K. Dabkowski, Yulia Gel

Assistant Professors: Mohammad Akbar, Maxim Arnold, Bhargab Chattopadhyay, Min Chen, Tobias Hagge, Qingwen Hu, Frank Konietschke, Yifei Lou, Oleg Makarenkov, Tomoki Oshawa, Qiongxia (Joanne) Song, Anh Tran

Senior Lecturers: Kelly Aman, Diana Cogan, Malgorzata Dabkowska, Anatoly Eydelzon, Manjula Foley, Bentley T. Garrett, Farid Khafizov, Yuly Koshevnik, David L. Lewis, Brady McCary, Derege Mussa, My Linh Nguyen, Jigarkumar Patel, William M. Scott, Paul Stanford

Affiliated Faculty: Hervé Abdi, Titu Andreescu, Alain Bensoussan, Raimund J. Ober, John J. Wiorkowski

Adjunct Faculty from the Research for Mathematics of the Mexican Council and Technology: Jose Gomez-Larranaga, Adolfo (Sanchez) Valenzuela

I. Core Curriculum Requirements: 42 semester credit hours[2]

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[3, 4]

Life and Physical Sciences: 6 semester credit hours[5]

Mathematics/Applied Mathematics Specialization

PHYS 2325 Mechanics

or PHYS 2421 Honors Physics I - Mechanics and Heat

PHYS 2326 Electromagnetism and Waves

or PHYS 2422 Honors Physics II - Electromagnetism and Waves

Statistics Specialization

PHYS 2325 Mechanics

or PHYS 2421 Honors Physics I - Mechanics and Heat

PHYS 2326 Electromagnetism and Waves

or PHYS 2422 Honors Physics II - Electromagnetism and Waves

Or

CHEM 1311 General Chemistry I

CHEM 1312 General Chemistry II

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

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

Social and Behavioral Sciences: 3 semester credit hours

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[3, 4]

MATH 2419 Calculus II[3, 4]

PHYS 2125 Physics Laboratory I[5]

II. Major Requirements: 48-49 semester credit hours

Major Preparatory Courses: 15-16 semester credit hours beyond Core Curriculum

For Mathematics Specialization

PHYS 2125 Physics Laboratory I[5]

PHYS 2325 Mechanics[5]

PHYS 2126 Physics Laboratory II

PHYS 2326 Electromagnetism and Waves[5]

For Statistics Specialization

PHYS 2125 Physics Laboratory I[5]

PHYS 2325 Mechanics[5]

PHYS 2126 Physics Laboratory II

PHYS 2326 Electromagnetism and Waves[5]

Or

CHEM 1111 General Chemistry Laboratory I[3]

CHEM 1112 General Chemistry Laboratory II[3]

CHEM 1311 General Chemistry I[3]

CHEM 1312 General Chemistry II[3]

For All

MATH 2370 Introduction to Programming with MATLAB

or CS 1325 Introduction to Programming I[6]

or CS 1337 Computer Science I[6]

MATH 2417 Calculus I[3, 4, 7]

MATH 2418 Linear Algebra[6]

MATH 2419 Calculus II[3, 4, 7]

MATH 2420 Differential Equations with Applications[6]

MATH 2451 Multivariable Calculus with Applications[6]

Major Core Courses: 21 semester credit hours

MATH 3310 Theoretical Concepts of Calculus

MATH 3311 Abstract Algebra I

MATH 3379 Complex Variables

MATH 4301 Mathematical Analysis I

MATH 4302 Mathematical Analysis II

MATH 4334 Numerical Analysis

STAT 4351 Probability

Major Related Courses: 12 semester credit hours

Applied Mathematics Specialization

MATH 4341 Topology

MATH 4355 Methods of Applied Mathematics

MATH 4362 Partial Differential Equations

STAT 4382 Stochastic Processes

Mathematics Specialization

MATH 3312 Abstract Algebra II

MATH 3380 Differential Geometry

MATH 4341 Topology

3 semester credit hours upper-division guided elective[8]

Statistics Specialization

STAT 3355 Data Analysis for Statisticians and Actuaries

STAT 4352 Mathematical Statistics

STAT 4382 Stochastic Processes

3 semester credit hours upper-division guided elective[8]

III. Elective Requirements: 29-30 semester credit hours

Electives: 29-30 semester credit hours

All students are required to take at least six semester credit hours of electives outside their major field of study. These must be either upper-division classes or lower-division classes that have prerequisites.

Both lower- and upper-division courses may count as electives, but the student must complete at least 51 semester credit hours of upper-division courses to qualify for graduation.

NOTE: Students transferring into Mathematics at the upper-division level are expected to have completed all of the 1000- and 2000- level mathematics core course requirements.

UTeach Option

The UTeach option may be added to the BS degree in Mathematics. UTeach Dallas Option degree plans are streamlined to allow students to complete both a rigorous Bachelor of Science or

Bachelor of Arts degree and all coursework for middle or high school teacher certification in four years. Teaching Option degrees require deep content knowledge combined with courses grounded in the latest research on math and science education. While most graduates go on to classroom teaching, UTeach alums are also prepared to enter graduate school and to work in discipline related industry.

Fast Track Baccalaureate/Master's Degrees

For students interested in pursuing graduate studies in Mathematics, the Mathematics Department offers an accelerated BS / MS Fast Track that involves taking graduate courses instead of several advanced undergraduate courses. Acceptance into the Fast Track is based on the student's attaining a GPA (grade point average) of at least 3.200 in all mathematics classes and being within 30 semester credit hours of graduation. Fast Track students may, during their senior year, take 15 graduate semester credit hours that may be used to complete the baccalaureate degree. After Fast Track admission to the graduate program, these 15 graduate semester credit hours may also satisfy requirements for the master's degree. Fast Track programs are offered in mathematics with specializations in applied mathematics and statistics.

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 course that also fulfills Core Curriculum requirements. If semester credit hours are counted in the Core Curriculum, students must complete additional coursework to meet the minimum requirement for graduation. Course selection assistance is available from the undergraduate advisor.

4. Three semester credit hours of Calculus are counted to fulfill the Mathematics Core Requirement with the remaining five semester credit hours to be counted under Component Area Option Core.

5. Six semester credit hours of Physics are counted under Science core, and one semester credit hour of Physics (PHYS 2125) is counted under Component Area Core.

6. Indicates a prerequisite class to be completed before enrolling in upper-division classes.

7. MATH 2417 and MATH 2419 requirements can be fulfilled by completing MATH 2413, MATH 2414, and MATH 2415.

8. Approval of Mathematics department advisor required.

Updated: 2019-08-09 13:16:00 v17.0c720c