School of Natural Sciences and Mathematics

Geosciences (BS)

Attaining greater understanding of past and present Earth processes is the fundamental goal of geosciences. To achieve this goal the geoscientist studies the minerals, rocks, fluids, and fossils of the Earth and investigates the physical, chemical, and biological processes occurring on and in the Earth.

Professional opportunities in geology exist in the environmental, energy, and mineral resources industries and in government agencies concerned with these fields. In addition, many occupations concerned with law, management, economics, and the environment utilize a background in geosciences.

Specific degree plans will be formulated by the undergraduate advisor in Geosciences. Changing circumstances may require changes to the degree plans.

Bachelor of Science in Geosciences

**Degree Requirements** (120 semester credit hours)¹

**View an Example of Degree Requirements by Semester**

Faculty

**Professors:** Carlos L. V. Aiken, John F. Ferguson, John W. Geissman, David Lumley, William I. Manton, George A. McMechan, John S. Oldow, Robert J. Stern

**Professors Emeritus:** David E. Dunn, Richard M. Mitterer, Emile A. Pessagno Jr., Dean C. Presnall, Robert H. Rutford

**Associate Professor:** Thomas H. Brikowski

**Associate Professor Emeritus:** James L. Carter

**Assistant Professor:** Hejun Zhu

**Senior Lecturers:** William R. Griffin, Ignacio Pujana, Prabin Shilpakar

I. Core Curriculum Requirements: 42 semester credit hours²

**Communication:** 6 semester credit hours

RHET 1302 Rhetoric

Mathematics: 3 semester credit hours
   MATH 2413 Differential Calculus$^3, 4$
   or MATH 2417 Calculus I$^3, 4$

Life and Physical Sciences: 6 semester credit hours
   CHEM 1311 General Chemistry I$^3$
   or CHEM 1315 Honors Freshman Chemistry I$^3$
   CHEM 1312 General Chemistry II$^3$
   or CHEM 1316 Honors Freshman Chemistry II$^3$

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
   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
   GEOS 1303 Physical Geology
   GEOS 1304 History of Earth and Life

II. Major Requirements: 62-76 semester credit hours

   Major Preparatory Courses: 21-23 semester credit hours beyond Core Curriculum
Prerequisite courses to be completed before enrolling in upper-division GEOS courses.

- **CHEM 1111** General Chemistry Laboratory I
  - or **CHEM 1115** Honors Freshman Chemistry Laboratory I
- **CHEM 1112** General Chemistry Laboratory II
  - or **CHEM 1116** Honors Freshman Chemistry Laboratory II
- **CHEM 1311** General Chemistry I
  - or **CHEM 1315** Honors Freshman Chemistry I
- **CHEM 1312** General Chemistry II
  - or **CHEM 1316** Honors Freshman Chemistry II
- **GEOS 1303** Physical Geology
- **GEOS 1304** History of Earth and Life
- **GEOS 1103** Physical Geology Laboratory
- **GEOS 1104** History of Earth and Life Laboratory
- **GEOS 2409** Rocks and Minerals
- **MATH 2413** Differential Calculus
  - or **MATH 2417** Calculus I
- **MATH 2414** Integral Calculus
  - or **MATH 2419** Calculus II
- **PHYS 2325** Mechanics
  - or **PHYS 2421** Honors Physics I - Mechanics and Heat
- **PHYS 2125** Physics Laboratory I
- **PHYS 2326** Electromagnetism and Waves
  - or **PHYS 2422** Honors Physics II - Electromagnetism and Waves
- **PHYS 2126** Physics Laboratory II

**Major Core Courses: 27 semester credit hours**

- **GEOS 2306** Essentials of Field Geologic Methods
- **GEOS 3300** Field Geology I (Summer Field Camp I)
- **GEOS 3421** Stratigraphy and Sedimentology
- **GEOS 3464** Igneous and Metamorphic Petrology
- **GEOS 3470** Structural Geology
GEOS 4300 Field Geology II (Summer Field Camp II)
GEOS 4320 The Physics and Chemistry of the Solid Earth
GEOS 4390 Communication in the Geosciences

Students may select either the Geology Option or the Geophysics Option.

A. Geology Option: 14-15 semester credit hours
   GEOS 3434 Paleobiology
   GEOS 4322 The Earth System
   GEOS 4430 Hydrogeology and Aqueous Geochemistry

A mathematics course selected from:
   MATH 2415 Calculus of Several Variables
   MATH 2418 Linear Algebra
   MATH 2451 Multivariable Calculus with Applications
   PHYS 3330 Numerical Methods in Physics and Computational Techniques

OR

B. Geophysics Option: 26 semester credit hours
   MATH 2418 Linear Algebra
   MATH 2420 Differential Equations with Applications
   MATH 2451 Multivariable Calculus with Applications
   MATH 4362 Partial Differential Equations
   PHYS 3411 Theoretical Physics
   PHYS 3312 Classical Mechanics
   PHYS 3416 Electricity and Magnetism

III. Elective Requirements: 2-16 semester credit hours (13-16 semester credit hours for Geology Option; 2-4 semester credit hours for Geophysics Option)

   Both lower- and upper-division courses may count as electives, but students must complete at least 51 semester credit hours of upper-division courses to qualify for graduation. Students are strongly encouraged to take GEOS graduate courses as free electives.
UTeach Option

The UTeach option may be added to either the BA or BS degree. 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

The Fast-Track program allows students with strong academic records to take selected graduate courses that may be applied toward the baccalaureate degree and be used to satisfy requirements for the master’s degree. Interested students who intend to pursue a master’s degree in Geosciences may apply for a Fast Track baccalaureate/master’s plan of study via the Geosciences graduate advisor. The planned coursework must be coordinated with the Geosciences undergraduate advisor; the Geosciences graduate advisor should also be notified. A maximum of 15 semester credit hours may be applied under this program.

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 Major requirement that also fulfills a Core Curriculum requirement.
4. Three semester credit hours are counted to fulfill the Mathematics Core Requirement with the remaining semester credit hour to be counted under the major requirements.