# Earth and Environmental Sciences - Undergraduate Programs

**Academic Advising: 107 Life Science Building · 817.272.9685**

## Degree Programs

### BACHELOR OF SCIENCE IN GEOLOGY

This degree has three options:

1. The **Professional Option** is for students who plan to enter the profession or go to graduate school but are uncertain where they want to concentrate. The program emphasizes breadth and exposes students to most of the geological disciplines.
2. The **Environmental Science Option** emphasizes the application of earth science to environmental problems associated with the hydrosphere, atmosphere and natural hazards.
3. The **Engineering Geology Option** is for students who are interested in combining Geology with Civil Engineering coursework to work with engineering firms on construction and environmental problems.

### BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE

This degree emphasizes on interdisciplinary training related to environmental sciences and is designed for students who plan to enter the profession or go to graduate school.

### BACHELOR OF ARTS IN GEOLOGY

This degree has three options:

1. The **General Option** is for students who want to combine Geology with other professional interests.
2. The **Geographic Information Systems Option** is for students who want to combine Geology with computer technology to store and analyze spatial data using GIS software.
3. The **Composite Science Teacher Certification Option** is for students who want teacher certification, and it is offered through the UTeach program.

## Requirements for a Bachelor of Science in Geology - Professional Option

This degree is for students who plan to enter the profession or go to graduate school. The program emphasizes breadth and exposes students to most of the geological disciplines.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/).

| PRE-PROFESSIONAL COURSES | | |
|---|---|---|
| RECOMMENDED CORE REQUIREMENTS | | |
| UNIV 1131 | STUDENT SUCCESS | 1 |
| ENGL 1301 | RHETORIC AND COMPOSITION I | 3 |
| ENGL 1302 | RHETORIC AND COMPOSITION II | 3 |
| Creative Arts * | | 3 |
| POLS 2311 | GOVERNMENT OF THE UNITED STATES | 3 |
| POLS 2312 | STATE AND LOCAL GOVERNMENT | 3 |
| Language, Philosophy and Culture * | | 3 |
| PHYS 1441 | GENERAL COLLEGE PHYSICS I | 4 |
| or PHYS 1443 | GENERAL TECHNICAL PHYSICS I | |
| PHYS 1442 | GENERAL COLLEGE PHYSICS II | 4 |
| or PHYS 1444 | GENERAL TECHNICAL PHYSICS II | |
| MATH 1426 | CALCULUS I | 4 |
| MATH 2425 | CALCULUS II | 4 |
| Social/Behavioral Science * | | 3 |
| HIST 1301 | HISTORY OF THE UNITED STATES TO 1865 | 3 |
| HIST 1302 | HISTORY OF THE UNITED STATES, 1865 TO PRESENT | 3 |
| Foundational Component Area * | | 3 |

| | | |
|---|---|---|
| **PROGRAM REQUIREMENTS** | | |
| Communication Competence - pass oral presentation requirement in GEOL 3441 or GEOL 3443, or complete COMS 1301, COMS 2302, or other equivalent course | | |
| Computer Competence - pass Computer Skills Placement test or any computer-related course such as: | | |
| GEOL 4330 | UNDERSTANDING GEOGRAPHIC INFORMATION SYSTEMS | |
| **PROFESSIONAL COURSES** | | |
| BIOL 1441 | BIOLOGY I FOR SCIENCE MAJORS: CELL AND MOLECULAR BIOLOGY | 4 |
| CHEM 1441 | GENERAL CHEMISTRY I | 4 |
| CHEM 1442 | GENERAL CHEMISTRY II | 4 |
| GEOL 3454 | STATISTICS FOR EARTH AND ENVIRONMENTAL SCIENTISTS | 4 |
| MINOR: 18 or more hours as required for Biology, Chemistry, Mathematics, or Physics | | 10 |
| MAJOR | | |
| GEOL 1301 | EARTH SYSTEMS | 3 |
| GEOL 1302 | EARTH HISTORY | 3 |
| GEOL 2445 | MINERALOGY | 4 |
| GEOL 3446 | PETROLOGY AND GEOCHEMISTRY | 4 |
| GEOL 3441 | BIOSTRATIGRAPHY AND LIFE THROUGH TIME | 4 |
| GEOL 3442 | SEDIMENTOLOGY AND STRATIGRAPHY | 4 |
| GEOL 3443 | STRUCTURAL GEOLOGY | 4 |
| GEOL 3387 | FIELD GEOLOGY I | 3 |
| GEOL 3388 | FIELD GEOLOGY II | 3 |
| GEOL 4330 | UNDERSTANDING GEOGRAPHIC INFORMATION SYSTEMS | |
| GEOL or ENVR 3000-4000-level electives (can not be GEOL4331, 4333, 4334, and 4354): | | 11 |
| **General Elective(s)** | | **4** |
| 36 hours of coursework must be advanced (3000/4000-level) to earn degree. | | |
| **Total Hours** | | **120** |

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

## TYPICAL COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the Earth and Environmental Sciences undergraduate advisor, particularly since many GEOL courses are not offered every semester. Students should also consult with the appropriate department for minor requirements; Biology minors should consult with the Earth and Environmental Sciences undergraduate advisor.

**First Year**

| | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|
| | UNIV 1131 | 1 | GEOL 1302 | 3 |
| | GEOL 1301 | 3 | MATH 2425 | 4 |
| | MATH 1426 | 4 | ENGL 1302 | 3 |
| | ENGL 1301 | 3 | CHEM 1442 | 4 |
| | CHEM 1441 | 4 | | |
| | **15** | | **14** | |

**Second Year**

| | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|
| | BIOL 1441 | 4 | PHYS 1442 | 4 |
| | POLS 2311 | 3 | POLS 2312 | 3 |
| | PHYS 1441 | 4 | Creative Arts* | 3 |
| | GEOL 2445 | 4 | Minor Course** | 4 |
| | **15** | | **14** | |

**Third Year**

| Summer Session | Hours | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|---|
| GEOL 3387 | 3 | GEOL 3441 | 4 | GEOL 3442 | 4 |
| GEOL 3388 | 3 | GEOL 3443 | 4 | minor course** | 3 |
| | | GEOL 4330 | 3 | GEOL 3446 | 4 |
| | | HIST 1301 | 3 | HIST 1302 | 3 |
| | **6** | | **14** | | **14** |

**Fourth Year**

| First Semester | Hours | Second Semester | Hours |
|---|---|---|---|
| Additional 4000 level Geology elective | 4 | Foundational Component Area* | 3 |
| minor course** | 3 | Approved Geol 4000 level courses | 8 |
| Language, Philosophy and Culture* | 3 | | |
| Social/Behavioral Science* | 3 | | |
| GEOL 3454 | 4 | | |
| **17** | | **11** | |

**Total Hours: 120**

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

** Actual number of courses/hours and course sequence determined by appropriate department.

## Requirements for a Bachelor of Science in Geology - Environmental Science Option

This degree emphasizes the application of earth science to environmental problems associated with the hydrosphere, atmosphere and natural hazards.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/).

| | | |
|---|---|---|
| **PRE-PROFESSIONAL COURSES** | | |
| RECOMMENDED CORE REQUIREMENTS | | |
| UNIV 1131 | STUDENT SUCCESS | 1 |
| ENGL 1301 | RHETORIC AND COMPOSITION I | 3 |
| ENGL 1302 | RHETORIC AND COMPOSITION II | 3 |
| Creative Arts * | | 3 |
| POLS 2311 | GOVERNMENT OF THE UNITED STATES | 3 |
| POLS 2312 | STATE AND LOCAL GOVERNMENT | 3 |
| Language, Philosophy and Culture * | | 3 |
| PHYS 1441 | GENERAL COLLEGE PHYSICS I | 4 |
| or PHYS 1443 | GENERAL TECHNICAL PHYSICS I | |
| PHYS 1442 | GENERAL COLLEGE PHYSICS II | 4 |
| or PHYS 1444 | GENERAL TECHNICAL PHYSICS II | |
| MATH 1426 | CALCULUS I | 4 |
| MATH 2425 | CALCULUS II | 4 |
| Social/Behavioral Science * | | 3 |
| HIST 1301 | HISTORY OF THE UNITED STATES TO 1865 | 3 |
| HIST 1302 | HISTORY OF THE UNITED STATES, 1865 TO PRESENT | 3 |
| Foundational Component Area * | | 3 |
| **PROGRAM REQUIREMENTS** | | |
| Communication Competence - pass oral presentation requirement in GEOL 3443 or complete COMS 1301, COMS 2302, or other equivalent course | | |
| Computer Competence - satisfied by GEOL 4330 | | |
| **PROFESSIONAL COURSES** | | |
| BIOL 1441 | BIOLOGY I FOR SCIENCE MAJORS: CELL AND MOLECULAR BIOLOGY | 4 |
| CHEM 1441 | GENERAL CHEMISTRY I | 4 |
| CHEM 1442 | GENERAL CHEMISTRY II | 4 |
| GEOL 3454 | STATISTICS FOR EARTH AND ENVIRONMENTAL SCIENTISTS | 4 |
| MINOR: 18 or more hours as required by the department of Biology or Chemistry and Biochemistry | | 10 |
| MAJOR | | |
| GEOL 1301 | EARTH SYSTEMS | 3 |
| GEOL 1302 | EARTH HISTORY | 3 |
| GEOL 2445 | MINERALOGY | 4 |
| ENVR 3317 | ENVIRONMENTAL HYDROLOGY | 3 |
| GEOL 3446 | PETROLOGY AND GEOCHEMISTRY | 4 |

| | | |
|---|---|---|
| GEOL 3442 | SEDIMENTOLOGY AND STRATIGRAPHY | 4 |
| GEOL 3443 | STRUCTURAL GEOLOGY | 4 |
| GEOL 3387 | FIELD GEOLOGY I | 3 |
| GEOL 3388 | FIELD GEOLOGY II | 3 |
| ENVR 4313 | ENVIRONMENTAL REGULATION OF CHEMICAL HAZARDS | 3 |
| GEOL 4330 | UNDERSTANDING GEOGRAPHIC INFORMATION SYSTEMS | 3 |
| **GEOL 4000-level elective (4 hours):** | | |
| GEOL 4405 | METEOROLOGY AND CLIMATOLOGY | 4 |
| or GEOL 4420 | HYDROGEOLOGY | |
| or GEOL 4465 | PHYSICAL OCEANOGRAPHY AND LIMNOLOGY | |
| or ENVR 4455 | MATHEMATICAL MODELING OF ENVIRONMENTAL QUALITY SYSTEMS | |
| or ENVR 4458 | MACHINE LEARNING FOR EARTH AND ENVIRONMENTAL SCIENTISTS | |
| 36 hours of coursework must be advanced (3000/4000-level) to earn degree. | | 6 |
| **Total Hours** | | **120** |

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

## TYPICAL COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the Earth and Environmental Sciences undergraduate advisor, particularly since many GEOL courses are not offered every semester. Biology minors should consult with the Earth and Environmental Sciences undergraduate advisor for minor requirements, and Chemistry minors should consult with the Chemistry and Biochemistry undergraduate advisor for minor requirements.

**First Year**

| | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|
| | UNIV 1131 | 1 | GEOL 1302 | 3 |
| | GEOL 1301 | 3 | MATH 2425 | 4 |
| | MATH 1426 | 4 | ENGL 1302 | 3 |
| | ENGL 1301 | 3 | CHEM 1442 | 4 |
| | CHEM 1441 | 4 | | |
| | **15** | | **14** | |

**Second Year**

| | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|
| | HIST 1301 | 3 | PHYS 1442 | 4 |
| | BIOL 1441 | 4 | HIST 1302 | 3 |
| | PHYS 1441 | 4 | Minor Course** | 4 |
| | GEOL 2445 | 4 | Creative Arts | 3 |
| | **15** | | **14** | |

**Third Year**

| Summer Session | Hours | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|---|
| GEOL 3387 | 3 | ENVR 3317 | 3 | GEOL 3442 | 4 |
| GEOL 3388 | 3 | GEOL 3443 | 4 | GEOL 4330 | 3 |
| | | GEOL 3454 | 4 | GEOL 3446 | 4 |
| | | POLS 2311 | 3 | POLS 2312 | 3 |
| | **6** | | **14** | | **14** |

**Fourth Year**

| | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|
| | ENVR 4313 | 3 | ENVR 4199, 4190, or 4189 | 1 |
| | GEOL 4405, 4420, 4465, or 4455 | 4 | minor course** | 8 |
| | minor course** | 3 | Foundational Component Area* | 3 |
| | Social/Behavioral Science* | 3 | Language, Philosophy, and Culture | 3 |
| | **13** | | **15** | |

**Total Hours: 120**

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

** Actual number of courses/hours and course sequence determined by appropriate department.

# Requirements for a Bachelor of Science in Geology - Geology Engineering Option

This degree is for students who are interested in combining Geology with Civil Engineering coursework to work with engineering firms on construction and environmental problems.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/).

| | | |
|---|---|---|
| **PRE-PROFESSIONAL COURSES** | | |
| RECOMMENDED CORE REQUIREMENTS | | |
| UNIV 1131 | STUDENT SUCCESS | 1 |
| ENGL 1301 | RHETORIC AND COMPOSITION I | 3 |
| ENGL 1302 | RHETORIC AND COMPOSITION II | 3 |
| Creative Arts * | | 3 |
| POLS 2311 | GOVERNMENT OF THE UNITED STATES | 3 |
| POLS 2312 | STATE AND LOCAL GOVERNMENT | 3 |
| Language, Philosophy and Culture * | | 3 |
| PHYS 1443 | GENERAL TECHNICAL PHYSICS I | 4 |
| PHYS 1444 | GENERAL TECHNICAL PHYSICS II | 4 |
| MATH 1426 | CALCULUS I | 4 |
| MATH 2425 | CALCULUS II | 4 |
| Social/Behavioral Science * | | 3 |
| HIST 1301 | HISTORY OF THE UNITED STATES TO 1865 | 3 |
| HIST 1302 | HISTORY OF THE UNITED STATES, 1865 TO PRESENT | 3 |
| Foundational Component Area * | | 3 |
| **PROGRAM REQUIREMENTS** | | |
| Communication Competence - pass oral presentation requirement in GEOL 3443 or complete COMS 1301, COMS 2302, or other equivalent course | | |
| Computer Competence - satisfied by GEOL 4330 | | |
| **PROFESSIONAL COURSES** | | |
| CHEM 1441 | GENERAL CHEMISTRY I | 4 |
| CHEM 1442 | GENERAL CHEMISTRY II | 4 |
| CE 2311 | STATICS | 3 |
| CE 2221 | DYNAMICS | 2 |
| CE 2313 | MECHANICS OF MATERIALS I | 3 |
| 12 hours of 3000 and 4000 level advisor approved Civil Engineering courses plus prerequisites | | 12 |
| MAJOR | | |
| GEOL 1301 | EARTH SYSTEMS | 3 |
| GEOL 1302 | EARTH HISTORY | 3 |
| GEOL 2445 | MINERALOGY | 4 |
| GEOL 3442 | SEDIMENTOLOGY AND STRATIGRAPHY | 4 |
| GEOL 3443 | STRUCTURAL GEOLOGY | 4 |
| GEOL 3387 | FIELD GEOLOGY I | 3 |
| GEOL 3388 | FIELD GEOLOGY II | 3 |
| GEOL 4420 | HYDROGEOLOGY | 4 |
| GEOL 4330 | UNDERSTANDING GEOGRAPHIC INFORMATION SYSTEMS | 3 |
| GEOL 4352 | ANALYTICAL METHODS IN GEOCHEMISTRY | 3 |
| **GEOL, ENVR, DATA, CE, ENGR Elective(s) as needed to total 120 hours for degree** | | **11** |
| 36 hours of coursework must be advanced (3000/4000-level) to earn degree. | | |
| **Total Hours** | | **120** |

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

## TYPICAL COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the Earth and Environmental Sciences undergraduate advisor, particularly since many GEOL courses are not offered every semester.

**First Year**

| | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|
| | UNIV 1131 | 1 | PHYS 1443 | 4 |
| | GEOL 1301 | 3 | GEOL 1302 | 3 |
| | MATH 1426 | 4 | MATH 2425 | 4 |
| | CHEM 1441 | 4 | ENGL 1302 | 3 |
| | ENGL 1301 | 3 | | |
| | **15** | | **14** | |

**Second Year**

| | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|
| | MATH 2326 | 3 | CHEM 1442 | 4 |
| | PHYS 1444 | 4 | CE 2313 | 3 |
| | CE 2311 | 3 | CE 2221 | 2 |
| | HIST 1301 | 3 | HIST 1302 | 3 |
| | | | Social/Behavior Science | 3 |
| | **13** | | **15** | |

**Third Year**

| Summer Session | Hours | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|---|
| GEOL 3387 | 3 | GEOL 2445 | 4 | GEOL 3442 | 4 |
| GEOL 3388 | 3 | GEOL 3443 | 4 | Advisor Approved CE, DATA, or MATH elective | 8 |
| | | Advisor Approved CE, DATA, or MATH Electives | 3 | POLS 2312 | 3 |
| | | POLS 2311 | 3 | | |
| | **6** | | **14** | | **15** |

**Fourth Year**

| | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|
| | GEOL 4330 | 3 | Foundational Component Area* | 3 |
| | GEOL 4352 | 3 | General Elective | 1 |
| | GEOL 4420 | 4 | Advisor Approved GEOL, ENVR, CE or MATH Electives | 10 |
| | Advisor Approved DATA, ENVR, GEOL, CE Electives | 4 | | |
| | **14** | | **14** | |

**Total Hours: 120**

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

# Requirements for a Bachelor of Science in Environmental Science

This degree is designed for students who plan to work in the environmental and sustainability sectors.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/).

**PRE-PROFESSIONAL COURSES**

| | | |
|---|---|---|
| RECOMMENDED CORE REQUIREMENTS | | |
| UNIV 1131 | STUDENT SUCCESS | 1 |
| ENGL 1301 | RHETORIC AND COMPOSITION I | 3 |
| ENGL 1302 | RHETORIC AND COMPOSITION II | 3 |
| Creative Arts * | | 3 |
| POLS 2311 | GOVERNMENT OF THE UNITED STATES | 3 |
| POLS 2312 | STATE AND LOCAL GOVERNMENT | 3 |
| Language, Philosophy and Culture * | | 3 |
| PHYS 1443 | GENERAL TECHNICAL PHYSICS I | 4 |
| or PHYS 1441 | GENERAL COLLEGE PHYSICS I | |
| PHYS 1444 | GENERAL TECHNICAL PHYSICS II | 4 |
| or PHYS 1442 | GENERAL COLLEGE PHYSICS II | |
| MATH 1426 | CALCULUS I | 4 |

| | | |
|---|---|---|
| MATH 2425 | CALCULUS II | 4 |
| Social/Behavioral Science * | | 3 |
| HIST 1301 | HISTORY OF THE UNITED STATES TO 1865 | 3 |
| HIST 1302 | HISTORY OF THE UNITED STATES, 1865 TO PRESENT | 3 |
| Foundation Component Area | | 3 |
| Computer Competence - pass Computer Skills Placement test or any computer-related course: | | 3 |
| GEOL 4330 | UNDERSTANDING GEOGRAPHIC INFORMATION SYSTEMS | |
| **PROFESSIONAL COURSES** | | |
| ENVR 3454 | STATISTICS FOR EARTH AND ENVIRONMENTAL SCIENTISTS | 4 |
| MAJOR | | |
| ENVR 1301 | INTRODUCTION TO ENVIRONMENTAL SCIENCE | 3 |
| ENVR 1330 | GLOBAL WARMING | 3 |
| or GEOL 1340 | WEATHER AND CLIMATE | |
| ENVR 2314 | THE GLOBAL ENVIRONMENT AND HUMAN HEALTH | 3 |
| ENVR 3317 | ENVIRONMENTAL HYDROLOGY | 3 |
| ENVR 3387 | ENVIRONMENTAL SCIENCE FIELD METHODS | 3 |
| ENVR 3457 | ENVIRONMENTAL ANALYTICAL CHEMISTRY | 4 |
| ENVR 4303 | TOPICS IN SUSTAINABILITY | 3 |
| ENVR 4313 | ENVIRONMENTAL REGULATION OF CHEMICAL HAZARDS | 3 |
| ENVR 4455 | MATHEMATICAL MODELING OF ENVIRONMENTAL QUALITY SYSTEMS (MODELING OF ENVR SYSTEMS) | 4 |
| or ENVR 4458 | MACHINE LEARNING FOR EARTH AND ENVIRONMENTAL SCIENTISTS | |
| GEOL 4323 | ISSUES IN ENVIRONMENTAL HEALTH | 3 |
| GEOL 4331 | ANALYSIS OF SPATIAL DATA | 3 |
| or GEOL 4332 | GLOBAL POSITIONING SYSTEM | |
| or GEOL 4333 | REMOTE SENSING FUNDAMENTALS | |
| or GEOL 4334 | GEOGRAPHIC DATA ANALYSIS | |
| GEOL 4405 | METEOROLOGY AND CLIMATOLOGY | 4 |
| or GEOL 4465 | PHYSICAL OCEANOGRAPHY AND LIMNOLOGY | |
| BIOL 1441 | BIOLOGY I FOR SCIENCE MAJORS: CELL AND MOLECULAR BIOLOGY | 4 |
| BIOL 1442 | BIOLOGY II FOR SCIENCE MAJORS: ECOLOGY AND EVOLUTION | 4 |
| BIOL 3356 | ENVIRONMENTAL SYSTEMS, BIOLOGICAL ASPECTS | 3 |
| or ENVR 4308 | ENVIRONMENTAL GEOCHEMISTRY | |
| or BIOL 3355 | TOXICOLOGY | |
| CHEM 1441 | GENERAL CHEMISTRY I | 4 |
| CHEM 1442 | GENERAL CHEMISTRY II | 4 |
| ENVR/GEOL/DATA/CHEM/BIO ELECTIVES (8 CREDIT HOURS) | | 8 |
| 36 hours of coursework must be upperdivision (3000/4000 - level) to earn the degree | | |
| **Total Hours** | | **120** |

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

## TYPICAL COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the Earth and Environmental Sciences undergraduate advisor, particularly since many GEOL courses are not offered every semester.

**First Year**

| First Semester | Hours | Second Semester | Hours |
|---|---|---|---|
| MATH 1426 | 4 | BIOL 1442 | 4 |
| BIOL 1441 | 4 | MATH 2425 | 4 |
| ENGL 1301 | 3 | ENGL 1302 | 3 |
| ENVR 1301 | 3 | ENVR 1330 | 3 |
| UNIV 1131 | 1 | | |
| | **15** | | **14** |

**Second Year**

| | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|
| | HIST 1301 | 3 | CHEM 1442 | 4 |
| | CHEM 1441 | 4 | PHYS 1442 or 1444 | 4 |
| | PHYS 1441 or 1443 | 4 | HIST 1302 | 3 |
| | Social and Behavioral Sciences | 3 | ENVR 2314 | 3 |
| | | **14** | | **14** |

**Third Year**

| Summer Session | Hours | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|---|
| ENVR 3387 | 3 | ENVR 3317 | 3 | POLS 2312 | 3 |
| | | ENVR 4313 | 3 | GEOL 4331, 4332, 4333, or 4334 | 3 |
| | | GEOL 3454 | 4 | BIOL 3356 or 3355 | 3 |
| | | POLS 2311 | 3 | GEOL 4323 | 3 |
| | | ENVR 4330 | 3 | Creative Arts* | 3 |
| | **3** | | **16** | | **15** |

**Fourth Year**

| | First Semester | Hours | Second Semester | Hours |
|---|---|---|---|---|
| | GEOL 4405 or 4465 | 4 | ENVR 4303 | 3 |
| | ENVR/GEOL/DATA/BIOL/CHEM Electives (8 Credits) | 8 | ENVR 4455 or 4458 | 4 |
| | Language, Philosophy, and Culture | 3 | ENVR 3457 | 4 |
| | | | Foundational Component Area | 3 |
| | **15** | | **14** | |

**Total Hours: 120**

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

## Requirements for a Bachelor of Arts in Geology - General Option

This degree is for students who want to combine Geology with other professional interests.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/).

| | | |
|---|---|---|
| **PRE-PROFESSIONAL COURSES** | | |
| RECOMMENDED CORE REQUIREMENTS | | |
| UNIV 1131 | STUDENT SUCCESS | 1 |
| ENGL 1301 | RHETORIC AND COMPOSITION I | 3 |
| ENGL 1302 | RHETORIC AND COMPOSITION II | 3 |
| Creative Arts * | | 3 |
| POLS 2311 | GOVERNMENT OF THE UNITED STATES | 3 |
| POLS 2312 | STATE AND LOCAL GOVERNMENT | 3 |
| Language, Philosophy and Culture * | | 3 |
| PHYS 1441 | GENERAL COLLEGE PHYSICS I | 4 |
| PHYS 1442 | GENERAL COLLEGE PHYSICS II | 4 |
| MATH 1308 | ELEMENTARY STATISTICAL ANALYSIS | 3 |
| MATH 1421 | PREPARATION FOR CALCULUS | 4 |
| Social/Behavioral Science * | | 3 |
| HIST 1301 | HISTORY OF THE UNITED STATES TO 1865 | 3 |
| HIST 1302 | HISTORY OF THE UNITED STATES, 1865 TO PRESENT | 3 |
| Foundational Component Area * | | 3 |
| **PROGRAM REQUIREMENTS** | | |
| Communication Competence - pass oral presentation requirement in GEOL 3441 or GEOL 3443, or complete COMS 1301, COMS 2302, or other equivalent course | | |
| Computer Competence - pass Computer Skills Placement test or any computer-related course such as: | | |
| GEOL 4330 | UNDERSTANDING GEOGRAPHIC INFORMATION SYSTEMS | |
| **PROFESSIONAL COURSES** | | |
| BIOL 1441 | BIOLOGY I FOR SCIENCE MAJORS: CELL AND MOLECULAR BIOLOGY | 4 |

| | | |
|---|---|---|
| BIOL 1442 | BIOLOGY II FOR SCIENCE MAJORS: ECOLOGY AND EVOLUTION | 4 |
| CHEM 1441 | GENERAL CHEMISTRY I | 4 |
| CHEM 1442 | GENERAL CHEMISTRY II | 4 |
| MINOR: 18 or more hours as required by the appropriate department | | 18 |
| MAJOR | | |
| GEOL 1301 | EARTH SYSTEMS | 3 |
| GEOL 1302 | EARTH HISTORY | 3 |
| GEOL 2445 | MINERALOGY | 4 |
| GEOL 3441 | BIOSTRATIGRAPHY AND LIFE THROUGH TIME | 4 |
| GEOL 3442 | SEDIMENTOLOGY AND STRATIGRAPHY | 4 |
| GEOL 3443 | STRUCTURAL GEOLOGY | 4 |
| GEOL 3446 | PETROLOGY AND GEOCHEMISTRY | 4 |
| GEOL, ENVR, or DATA advanced (3000/4000-level) electives approved by the Earth and Environmental Sciences undergraduate advisor | | 11 |
| **General Electives** | | **3** |
| 36 hours of coursework must be advanced (3000/4000-level) to earn degree. | | |
| **Total Hours** | | **120** |

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

## TYPICAL COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the Earth and Environmental Sciences undergraduate advisor, particularly since many GEOL courses are not offered every semester. Students should also consult with the appropriate department for minor requirements.

**First Year**

| First Semester | Hours | Second Semester | Hours |
|---|---|---|---|
| GEOL 1301 | 3 | GEOL 1302 | 3 |
| MATH 1421 | 4 | MATH 1308 | 3 |
| ENGL 1301 | 3 | ENGL 1302 | 3 |
| CHEM 1441 | 4 | CHEM 1442 | 4 |
| UNIV 1131 | 1 | Creative Arts | 3 |
| | **15** | | **16** |

**Second Year**

| First Semester | Hours | Second Semester | Hours |
|---|---|---|---|
| minor course** | 3 | minor course** | 3 |
| PHYS 1441 | 4 | POLS 2311 | 3 |
| BIOL 1441 | 4 | PHYS 1442 | 4 |
| GEOL 2445 | 4 | BIOL 1442 | 4 |
| | **15** | | **14** |

**Third Year**

| First Semester | Hours | Second Semester | Hours |
|---|---|---|---|
| GEOL 3443 | 4 | GEOL 3442 | 4 |
| POLS 2312 | 3 | approved GEOL,ENVR, or DATA advanced (3000/4000-level) elective | 4 |
| HIST 1301 | 3 | GEOL 3446 | 4 |
| HIST 1302 | 3 | HIST 1302 | 3 |
| General Elective | 3 | | |
| | **16** | | **15** |

**Fourth Year**

| First Semester | Hours | Second Semester | Hours |
|---|---|---|---|
| GEOL 3441 | 4 | approved GEOL 4000-level elective | 1 |
| approved GEOL, ENVR, or DATA advanced (3000/4000-level) elective | 3 | minor course** | 6 |
| minor course** | 6 | Language, Philosophy and Culture* | 3 |

| | | | |
|---|---|---|---|
| Social/Behavioral Science* | 3 | Foundational Component Area* | 3 |
| | **16** | | **13** |

**Total Hours: 120**

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

** Actual number of courses/hours and course sequence determined by appropriate department.

# Requirements for a Bachelor of Arts in Geology - Geographic Information Systems Option

This degree is for students who want to combine Geology with computer technology to store and analyze spatial data using GIS software.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/).

| | | |
|---|---|---|
| **PRE-PROFESSIONAL COURSES** | | |
| RECOMMENDED CORE REQUIREMENTS | | |
| UNIV 1131 | STUDENT SUCCESS | 1 |
| ENGL 1301 | RHETORIC AND COMPOSITION I | 3 |
| ENGL 1302 | RHETORIC AND COMPOSITION II | 3 |
| Creative Arts * | | 3 |
| POLS 2311 | GOVERNMENT OF THE UNITED STATES | 3 |
| POLS 2312 | STATE AND LOCAL GOVERNMENT | 3 |
| Language, Philosophy and Culture * | | 3 |
| PHYS 1441 | GENERAL COLLEGE PHYSICS I | 4 |
| PHYS 1442 | GENERAL COLLEGE PHYSICS II | 4 |
| MATH 1308 | ELEMENTARY STATISTICAL ANALYSIS | 3 |
| MATH 1421 | PREPARATION FOR CALCULUS | 4 |
| Social/Behavioral Science * | | 3 |
| HIST 1301 | HISTORY OF THE UNITED STATES TO 1865 | 3 |
| HIST 1302 | HISTORY OF THE UNITED STATES, 1865 TO PRESENT | 3 |
| Foundational Component Area * | | 3 |
| **PROGRAM REQUIREMENTS** | | |
| Communication Competence - pass oral presentation requirement in GEOL 3441 or GEOL 3443, or complete COMS 1301, COMS 2302, or other equivalent course | | |
| Computer Competence - satisfied by GEOL 4330 | | |
| **PROFESSIONAL COURSES** | | |
| BIOL 1441 | BIOLOGY I FOR SCIENCE MAJORS: CELL AND MOLECULAR BIOLOGY | 4 |
| BIOL 1442 | BIOLOGY II FOR SCIENCE MAJORS: ECOLOGY AND EVOLUTION | 4 |
| CHEM 1441 | GENERAL CHEMISTRY I | 4 |
| CHEM 1442 | GENERAL CHEMISTRY II | 4 |
| MINOR: 18 hours as required by appropriate department | | 18 |
| MAJOR | | |
| GEOL 1301 | EARTH SYSTEMS | 3 |
| GEOL 1302 | EARTH HISTORY | 3 |
| GEOL 2445 | MINERALOGY | 4 |
| GEOL 3446 | PETROLOGY AND GEOCHEMISTRY | 4 |
| GEOL 3441 | BIOSTRATIGRAPHY AND LIFE THROUGH TIME | 4 |
| GEOL 3442 | SEDIMENTOLOGY AND STRATIGRAPHY | 4 |
| GEOL 3443 | STRUCTURAL GEOLOGY | 4 |
| GEOL 4330 | UNDERSTANDING GEOGRAPHIC INFORMATION SYSTEMS | 3 |
| GEOL 4331 | ANALYSIS OF SPATIAL DATA | 3 |
| GEOL 4333 | REMOTE SENSING FUNDAMENTALS | 3 |

| | | |
|---|---|---|
| GEOL 4334 | GEOGRAPHIC DATA ANALYSIS | 3 |
| **General Elective(s)** | | **2** |
| 36 hours of coursework must be advanced (3000/4000-level) to earn degree. | | |
| **Total Hours** | | **120** |

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

## TYPICAL COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the Earth and Environmental Sciences undergraduate advisor, particularly since many GEOL courses are not offered every semester. Students should also consult with the appropriate department for minor requirements.

**First Year**

| First Semester | Hours | Second Semester | Hours |
|---|---|---|---|
| GEOL 1301 | 3 | GEOL 1302 | 3 |
| MATH 1324 | 3 | MATH 1308 | 3 |
| ENGL 1301 | 3 | ENGL 1302 | 3 |
| Creative Arts* | 3 | Language, Philosophy and Culture* | 3 |
| CHEM 1441 | 4 | CHEM 1442 | 4 |
| | **16** | | **16** |

**Second Year**

| First Semester | Hours | Second Semester | Hours |
|---|---|---|---|
| GEOL 2445 | 4 | minor course** | 3 |
| HIST 1301 | 3 | PHYS 1442 | 4 |
| PHYS 1441 | 4 | POLS 2311 | 3 |
| BIOL 1441 | 4 | Social/Behavioral Science* | 3 |
| | | HIST 1302 | 3 |
| | | BIOL 1442 | 4 |
| | **15** | | **20** |

**Third Year**

| First Semester | Hours | Second Semester | Hours |
|---|---|---|---|
| GEOL 3443 | 4 | GEOL 3442 | 4 |
| GEOL 4330 | 3 | GEOL 4331 | 3 |
| minor course** | 6 | minor course** | 3 |
| | | GEOL 3446 | 4 |
| | **13** | | **14** |

**Fourth Year**

| First Semester | Hours | Second Semester | Hours |
|---|---|---|---|
| GEOL 3441 | 4 | GEOL 4334 | 3 |
| GEOL 4333 | 3 | minor course** | 3 |
| minor course** | 3 | POLS 2312 | 3 |
| | | General Elective(s) | 7 |
| | **10** | | **16** |

**Total Hours: 120**

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

** Actual number of courses/hours and course sequence determined by appropriate department.

# Requirements for a Bachelor of Arts in Geology - Composite Science Teacher Certification Option (UTeach)

This degree is for students who want teacher certification, and it is offered through the UTeach program.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/).

**PRE-PROFESSIONAL COURSES**

| | | |
|---|---|---|
| RECOMMENDED CORE REQUIREMENTS | | |
| UNIV 1131 | STUDENT SUCCESS | 1 |

| | | |
|---|---|---|
| ENGL 1301 | RHETORIC AND COMPOSITION I | 3 |
| ENGL 1302 | RHETORIC AND COMPOSITION II | 3 |
| Creative Arts * | | 3 |
| POLS 2311 | GOVERNMENT OF THE UNITED STATES | 3 |
| POLS 2312 | STATE AND LOCAL GOVERNMENT | 3 |
| Language, Philosophy and Culture * | | 3 |
| PHYS 1441 | GENERAL COLLEGE PHYSICS I | 4 |
| PHYS 1442 | GENERAL COLLEGE PHYSICS II | 4 |
| MATH 1421 | PREPARATION FOR CALCULUS | 4 |
| MATH 1308 | ELEMENTARY STATISTICAL ANALYSIS | 3 |
| Social/Behavioral Science * | | 3 |
| HIST 1301 | HISTORY OF THE UNITED STATES TO 1865 | 3 |
| HIST 1302 | HISTORY OF THE UNITED STATES, 1865 TO PRESENT | 3 |
| Foundational Component Area * | | 3 |
| **PROGRAM REQUIREMENTS** | | |
| Communication Competence - pass oral presentation requirement in GEOL 3441 or GEOL 3443, or complete COMS 1301, COMS 2302, or other equivalent course | | |
| Computer Competence - satisfied by EDUC 4331 | | |
| **PROFESSIONAL COURSES** | | |
| BIOL 1441 | BIOLOGY I FOR SCIENCE MAJORS: CELL AND MOLECULAR BIOLOGY | 4 |
| BIOL 1442 | BIOLOGY II FOR SCIENCE MAJORS: ECOLOGY AND EVOLUTION | 4 |
| BIOL 3315 | GENETICS | 3 |
| BIOL 3454 | GENERAL ZOOLOGY | 4 |
| ENVR 4303 | TOPICS IN SUSTAINABILITY | 3 |
| CHEM 1441 | GENERAL CHEMISTRY I | 4 |
| CHEM 1442 | GENERAL CHEMISTRY II | 4 |
| TEACHER CERTIFICATION (UTEACH) | | |
| SCIE 1201 | STEP 1: INQUIRY APPROACHES TO TEACHING | 2 |
| SCIE 1202 | STEP 2: INQUIRY-BASED LESSON DESIGN | 2 |
| SCIE 4107 | CLINICAL TEACHING SEMINAR | 1 |
| SCIE 4607 | CLINICAL TEACHING FOR SECONDARY GRADES | 6 |
| EDUC 4331 | KNOWING AND LEARNING IN MATH AND SCIENCE | 3 |
| EDUC 4332 | CLASSROOM INTERACTIONS | 3 |
| EDUC 4333 | MULTIPLE TEACHING PRACTICES IN MATH AND SCIENCE | 3 |
| PHIL 2314 | PERSPECTIVES ON SCIENCE AND MATHEMATICS | 3 |
| MAJOR | | |
| GEOL 1301 | EARTH SYSTEMS | 3 |
| GEOL 1302 | EARTH HISTORY | 3 |
| GEOL 2445 | MINERALOGY | 4 |
| GEOL 3446 | PETROLOGY AND GEOCHEMISTRY | 4 |
| or GEOL 3441 | BIOSTRATIGRAPHY AND LIFE THROUGH TIME | |
| GEOL 3442 | SEDIMENTOLOGY AND STRATIGRAPHY | 4 |
| GEOL 3443 | STRUCTURAL GEOLOGY | 4 |
| GEOL 4343 | RESEARCH METHODS - UTEACH | 3 |
| 36 hours of coursework must be advanced (3000/4000-level) to earn degree. | | |
| **Total Hours** | | **120** |

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

## TYPICAL COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the UTeach advisor, particularly since many GEOL courses are not offered every semester.

| First Year | | | |
|---|---|---|---|
| **First Semester** | **Hours** | **Second Semester** | **Hours** |
| UNIV 1131 | 1 | GEOL 1302 | 3 |
| GEOL 1301 | 3 | MATH 1308 | 3 |
| MATH 1421 | 4 | ENGL 1302 | 3 |
| SCIE 1201 | 2 | SCIE 1202 | 2 |
| CHEM 1441 | 4 | CHEM 1442 | 4 |
| | **14** | | **15** |
| **Second Year** | | | |
| **First Semester** | **Hours** | **Second Semester** | **Hours** |
| EDUC 4331 | 3 | Creative Arts* | 3 |
| PHYS 1441 | 4 | EDUC 4332 | 3 |
| BIOL 1441 | 4 | PHYS 1442 | 4 |
| GEOL 2445 | 4 | BIOL 1442 | 4 |
| | **15** | | **14** |
| **Third Year** | | | |
| **First Semester** | **Hours** | **Second Semester** | **Hours** |
| GEOL 3443 | 4 | GEOL 3442 | 4 |
| BIOL 3315 | 3 | BIOL 3454 | 4 |
| PHIL 2314 | 3 | GEOL 4343 | 3 |
| HIST 1301 | 3 | ENVR 4303 | 3 |
| ENGL 1301 | 3 | HIST 1302 | 3 |
| | **16** | | **17** |
| **Fourth Year** | | | |
| **First Semester** | **Hours** | **Second Semester** | **Hours** |
| GEOL 3441 or 3446 | 4 | POLS 2312 | 3 |
| POLS 2311 | 3 | Language, Philosophy and Culture* | 3 |
| Social/Behavioral Science* | 3 | Foundational Component Area* | 3 |
| EDUC 4333 | 3 | SCIE 4107 | 1 |
| | | SCIE 4607 | 6 |
| | **13** | | **16** |

**Total Hours: 120**

* See General Core Requirements (http://catalog.uta.edu/archives/2022-2023/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

# Requirements for a Minor in Geology

A minimum total of 18 credit hours (including a minimum of 6 hours at the 3000-4000 level) are required. Transfer students must complete a minimum of 9 hours at UTA, 6 of which must be 3000-4000 level. A 2.0 GPA is required for coursework in the minor.

**The following courses cannot be used for the minor**: GEOL 3100, GEOL 3340, GEOL 4189, GEOL 4190, GEOL 4289, GEOL 4393.

# Requirements for a Minor in Data Science (for Majors in Earth and Environmental Sciences)

Students who are pursuing a major in the Department of Earth and Environmental Sciences and a minor in Data Science must meet with a Earth and Environmental Science Advisor who approves the minor courses. The following courses normally satisfy the requirements and are recommended by the Earth and Environmental Science Department.

| **REQUIRED COURSES** | | |
|---|---|---|
| DATA 1301 | INTRODUCTION TO DATA SCIENCE | 3 |
| DATA 3401 | PYTHON FOR DATA SCIENCE 1 | 4 |
| DATA 3461 | MACHINE LEARNING | 4 |
| or ENVR 4458 | MACHINE LEARNING FOR EARTH AND ENVIRONMENTAL SCIENTISTS | |
| ADVANCED ELECTIVES - choose from the following: | | 9 |

| | |
|---|---|
| DATA 3402 | PYTHON FOR DATA SCIENCE 2 |
| DATA 3421 | DATA MINING, MANAGEMENT, AND CURATION |
| DATA 3441 | STATISTICAL METHODS FOR DATA SCIENCE 1 |
| DATA 3442 | STATISTICAL METHODS FOR DATA SCIENCE 2 |
| DATA 4380 | DATA PROBLEMS |
| DATA 4381 | DATA CAPSTONE PROJECT 1 |
| other DATA advanced elective(s) approved by the Earth and Environmental Science undergraduate advisor | |
| **Total Hours** | **20** |

## Requirements for a Minor in Biology (for Majors in Earth and Environmental Sciences)

Students who are pursuing a major in the Department of Earth and Environmental Sciences and a minor in Biology must meet with a Biology Advisor who approves the minor courses. The following courses normally satisfy the requirements of the Biology Department and are recommended by the EES Department.

A minimum total of 18 credit hours (including a minimum of 6 hours at the 3000-4000 level) are required. Transfer students must complete a minimum of 9 hours at UTA, 6 of which must be 3000-4000 level. A 2.0 GPA is required for coursework in the minor.

| **REQUIRED COURSES** | | |
|---|---|---|
| BIOL 1441 | BIOLOGY I FOR SCIENCE MAJORS: CELL AND MOLECULAR BIOLOGY | 4 |
| BIOL 1442 | BIOLOGY II FOR SCIENCE MAJORS: ECOLOGY AND EVOLUTION | 4 |
| ADVANCED ELECTIVES - choose from the following: | | 10 |
| BIOL 2300 | BIOSTATISTICS | |
| BIOL 3301 | CELL PHYSIOLOGY | |
| BIOL 3315 | GENETICS | |
| BIOL 3318 | LIMNOLOGY | |
| BIOL 3339 | INTRODUCTION TO EVOLUTION | |
| BIOL 3355 | TOXICOLOGY | |
| BIOL 3457 | GENERAL ECOLOGY | |
| other BIOL advanced elective(s) approved by the Biology undergraduate advisor | | |
| **Total Hours** | | **18** |

## Requirements for Certification in Geographic Information Systems

Certification in Geographic Information Systems is designed for students in non-Earth and Environmental Sciences majors who want to become proficient in spatial data analysis, which is used in business, liberal arts, engineering and architecture disciplines.

This is a certification program and it does not lead to a second major or minor. However, students may use these courses to count towards a Geology minor. Students who are in the Geology B.A. Geographic Information Systems Option or Geoinformatics B.S. degree plans may not also earn this certificate, as the certificate courses are required for those degrees.

Students must obtain a 3.0 cumulative GPA in the required courses in order to earn the certificate.

| **REQUIRED COURSES** | | |
|---|---|---|
| GEOL 4330 | UNDERSTANDING GEOGRAPHIC INFORMATION SYSTEMS | 3 |
| GEOL 4331 | ANALYSIS OF SPATIAL DATA | 3 |
| GEOL 4333 | REMOTE SENSING FUNDAMENTALS | 3 |
| GEOL 4334 | GEOGRAPHIC DATA ANALYSIS | 3 |
| **Total Hours** | | **12** |