GEOLOGICAL SCIENCES MAJOR, B.S.–EARTH SCIENCE CONCENTRATION

Contact Information
Department of Geological Sciences
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The study of earth’s dynamic systems is a field that has seen major advances over the last few decades. Geologists investigate diverse systems that play a large role in controlling the environment at the earth’s surface.

Department Programs

Majors

• Geological Sciences Major, B.S.–Earth Science Concentration (p. 1)
• Geological Sciences Major, B.S.–Geochemistry Concentration (http://catalog.unc.edu/undergraduate/programs-study/geological-sciences-major-bs-geochemistry-concentration)
• Geological Sciences Major, B.S.–Paleobiology Concentration (http://catalog.unc.edu/undergraduate/programs-study/geological-sciences-major-bs-paleobiology-concentration)

Minor

• Geological Sciences Minor (http://catalog.unc.edu/undergraduate/programs-study/geological-sciences-minor)

Graduate Programs

• M.S. in Geological Sciences (http://catalog.unc.edu/graduate-schools-departments/geological-sciences)
• Ph.D. in Geological Sciences (http://catalog.unc.edu/graduate-schools-departments/geological-sciences)

Requirements

In addition to the program requirements listed below, students must

• complete a minimum of 45 academic credit hours earned from UNC-Chapel Hill courses
• take at least half of their major course requirements (courses and credit hours) at UNC-Chapel Hill
• earn a minimum of 18 hours of C or better in the major core requirements (some majors require 21 hours).

For more information, please consult the degree requirements section of the catalog (http://catalog.unc.edu/undergraduate/general-education-curriculum-degree-requirements/#degreesrequirementstext).

Core Requirements

All of the following courses:

GEOL 301 Earth Materials: Minerals 4
GEOL 401 Structural Geology 4
GEOL 402 Sedimentology and Stratigraphy 4
GEOL 404 Petrology and Plate Tectonics 4
GEOL 601 Summer Field Course in Geology 3
GEOL 602 Summer Field Course in Geology 3

Four geology courses numbered above 400 and not otherwise required for the major (GEOL 395 and GEOL 396 count if taken for two or three credit hours)

Additional Requirements

One of the following courses: 1 4
GEOL 101 Introductory Geology
& 101L and Introductory Geology Laboratory

GEOL 103 The Marine Environment
& GEOL 101L and Introductory Geology Laboratory

GEOL 105 Violent Earth
& GEOL 101L and Introductory Geology Laboratory

GEOL 109 Earth, Climate, and Life through Time
& GEOL 101L and Introductory Geology Laboratory

GEOL 110 Earth and Climate for Science Majors
& GEOL 101L and Introductory Geology Laboratory

CHEM 101 General Descriptive Chemistry I
& 101L and Quantitative Chemistry Laboratory I

CHEM 102 General Descriptive Chemistry II
& 102L and Quantitative Chemistry Laboratory II H

MATH 231 Calculus of Functions of One Variable I 3
MATH 232 Calculus of Functions of One Variable II 3

One of the following: 3
Any COMP 110 or above, except COMP 380
GEOL 520 Data Analysis in the Earth Sciences 2
Any MATH above MATH 232
Any STOR 155 or above

One of the following courses: 4
PHYS 104 General Physics I

PHYS 114 General Physics I: For Students of the Life Sciences

PHYS 116 Mechanics H

PHYS 118 Introductory Calculus-based Mechanics and Relativity

One of the following courses: 4
BIOL 101 Principles of Biology
& 101L and Introductory Biology Laboratory H

Any CHEM above CHEM 102
At least five science electives not otherwise required for the major
(see chart below)  15

Total Hours  78

H Honors version available. An honors course fulfills the same
requirements as the nonhonors version of that course. Enrollment
and GPA restrictions may apply.

1 only one of GEOL 101, GEOL 105, GEOL 109, and GEOL 110 may be
taken for course credit

2 this course may also be used to satisfy one of the required GEOL
courses numbered above 400

### Science Electives Not Otherwise Required for the Major

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 143</td>
<td>Human Evolution and Adaptation</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 220</td>
<td>Principles of Archaeology</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 315</td>
<td>Human Genetics and Evolution</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 317</td>
<td>Evolutionary Perspectives on Human Adaptation and Behavior</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 412</td>
<td>Paleoanthropology</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 414</td>
<td>Laboratory Methods: Human Osteology</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 451</td>
<td>Field School in North American Archaeology H</td>
<td>6</td>
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any Astronomy (ASTR) except a first-year seminar

any Biochemistry (BIOC) except a first-year seminar, BIOC 107 and BIOC 108

any Biology (BIOL) above BIOL 113

any Chemistry (CHEM) above CHEM 102

any Computer Science (COMP) 110 or above, except COMP 380

any Environmental Health Sciences (ENVR) except a first-year seminar and ENVR 600

GEOG 370 | Introduction to Geographic Information | 3 |
GEOG 410 | Modeling of Environmental Systems | 3 |
GEOG 412 | Synoptic Meteorology | 3 |
GEOG 414 | Climate Change | 3 |
GEOG 416 | Applied Climatology: The Impacts of Climate and Weather on Environmental and Social Systems | 3 |

any Geography (GEOG) above GEOG 477

any Geological Sciences (GEOL) except GEOL 101, GEOL 105, GEOL 109, and GEOL 110

any Marine Sciences (MASC) 101 and above

any Mathematics (MATH) above MATH 232

any Physics (PHYS) except a first-year seminar, PHYS 101, PHYS 132, and PHYS 313

any Statistics and Operations Research (STOR) 155 and above

H Honors version available. An honors course fulfills the same
requirements as the nonhonors version of that course. Enrollment
and GPA restrictions may apply.

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### Special Opportunities in Geological Sciences

#### Honors in Geological Sciences

The honors program in the Department of Geological Sciences is open to undergraduates with an overall grade point average of 3.3 or better as of the beginning of the fall semester of the senior year. To participate in this program, the student chooses a research topic in consultation with his or her chosen faculty sponsor and conducts the research during the last two semesters in residence. The research project should represent the equivalent time expenditure of six hours of course credit and is taken as GEOL 691H (fall semester) and GEOL 692H (spring semester).

Upon recommendation of the faculty, students may be awarded the degree with honors or highest honors. Highest honors is reserved for students who have distinguished themselves in both coursework and independent research. In order to obtain this distinction the student must maintain a grade point average of 3.60 or higher and complete a research project that is worthy of peer-reviewed publication.

#### Departmental Involvement

The Department of Geological Sciences encourages the active participation of undergraduates in department research, teaching, and social life. In addition to opportunities for experiential education and teaching internships described below, the department has an active Geology Honor Fraternity and Geology Club and regularly sponsors field excursions, career information sessions, and social events. Dates, times, and locations for all events are posted on the Web site and in the main lobby on the first floor of Mitchell Hall.

#### Experiential Education

Many geology courses emphasize experiential learning through field and laboratory work. Most degree tracks include a field geology course (GEOL 601 and GEOL 602 or a similar course in another department) that fulfills the experiential education General Education requirement for the
College of Arts and Sciences. Additionally, all students are encouraged to contact faculty members about conducting independent research, either as an honors thesis or a senior thesis project.

**UNC–BEST**

The UNC Baccalaureate Education in Science and Teaching (UNC–BEST) Program is a collaboration between the School of Education and the College of Arts and Sciences and is designed to allow undergraduate science majors interested in teaching high school science the opportunity to earn their science degree and obtain licensure as a North Carolina high school science teacher in four years. The program consists of core education classes (EDUC 516 or EDUC 689 or EDUC 690, EDUC 532, EDUC 615, EDUC 593, and EDUC 601) and a teaching methods class (GEOL 412) that is housed in the Department of Geological Sciences. For more details on admission requirements, application deadlines, and submitting an online application, visit the School of Education Web site (http://soe.unc.edu/academics/uncbest).

**Study Abroad**

Although the department has no formalized study abroad program, many students participate in a study abroad program, and some receive credit for geology coursework completed abroad. Students interested in a study abroad program should contact the director of undergraduate studies. Students must receive approval from the director of undergraduate studies prior to taking courses abroad for geology credit.

**Undergraduate Awards**

The Op White Prize in Geology, established in 1966, consists of a cash prize and an engraved bronze plaque displayed in the geology office. The award is given annually to the outstanding senior in geology.

**Field Camp Scholarships**

Several scholarships for geology field camp are awarded each year from the Grover Murray and Anadarko funds.

**Undergraduate Research**

The Department of Geological Sciences encourages qualified undergraduate students to conduct independent research on an interesting geologic topic under the direction of a geological sciences faculty member. This research can be conducted as a one- to four-credit hour project (GEOL 395) or in conjunction with the geology honors program.