UNC COLLEGE OF ARTS & SCIENCES

THE UNIVERSITY *of* NORTH CAROLINA
at CHAPEL HILL

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October 27, 2017

Nick Siedentop
Curriculum Director for Undergraduate Curricula
Office of Undergraduate Education
CB #3504, 3010 Steele Building, 214 E. Cameron Avenue
Chapel Hill, North Carolina 27599

Dear Nick,

We are requesting a small change in our current BS and BA curricula. We did a major overhaul last year and realized that GEOL. 301 (Earth Materials, 4 credit hours) should be included in the approved list of courses that can satisfy the following core requirements:

BA
A minimum of 11 credits from the following GEOL courses:

BS (both tracks)
13 credit hours from the following options:

Sincerely,

JONATHAN M. LEES
PROFESSOR AND DEPARTMENT CHAIR
THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

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

Contact Information

Department of Geological Sciences
http://www.geosci.unc.edu
104 South Road, Mitchell Hall, CB# 3315
(919) 966-4516

Jonathan Lees, Chair

Kevin Stewart, Director of Undergraduate Studies
kgstewar@email.unc.edu

Deborah Harris, Student Services Manager
djharris@email.unc.edu

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.A.–Earth Science (p. 1)
- Geological Sciences Major, B.S.–Earth Science (http://catalog.unc.edu/undergraduate/programs-study/geological-sciences-major-bs-earth-science-concentration)
- Geological Sciences Major, B.S.–Environmental Geoscience (http://catalog.unc.edu/undergraduate/programs-study/geological-sciences-major-bs-environmental-geoscience-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)

Student Learning Outcomes

Upon completion of the geological sciences program (B.A.), students should be able to:

- Demonstrate broad knowledge of core geological concepts
- Produce written synthesis of professional journal articles dealing with topics covered in advanced courses
- Make a clear and effective oral presentation
- Apply knowledge and skills from coursework in a significant field experience in an area of geological sciences

In addition to the program requirements listed below, students must

- attain a final cumulative GPA of at least 2.0
- 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/#degreerequirementstext).

Code	Title	Hours
Core Requirements		
GEOL 200	The Solid Earth	3
GEOL 201	Earth's Surface: Processes, Landforms, and History	3
A minimum of 11 credits from the following GEOL courses:		11
GEOL 202	Earth Systems History	
GEOL 215	Energy Resources	
GEOL 221	Geology of North America	
GEOL 301	Earth Materials: Minerals	
GEOL 302	Structural Geology	
GEOL 303	Sedimentology and Stratigraphy	
GEOL 304	Petrology and Plate Tectonics	
GEOL 324 & 324L	Water in Our World: Introduction to Hydrologic Science and Environmental Problems and Water in Our World Laboratory	
Capstone requirement:		6
GEOL 485 & GEOL 486	Summer Field Course in Geology and Summer Field Course in Geology	
GEOL 691H & GEOL 692H	Honors and Honors	
GEOL 395	Undergraduate Research in Geology [1]	
Science-oriented Experiential Education (EE) courses (6 credits total). [2]		
Additional Requirements		
CHEM 101 & 101L	General Descriptive Chemistry I and Quantitative Chemistry Laboratory I	4
MATH 130	Precalculus Mathematics	3
At least three geology and/or allied science electives not otherwise required for the major (see below chart)		9
Total Hours		39

[1] 6 credits of independent research

[2] Must be pre-approved by the Director of Undergraduate Studies.

Geology and/or Allied Science Electives Not Otherwise Required for the Major

Code	Title	Hours
ANTH 143	Human Evolution and Adaptation	3
ANTH 220	Principles of Archaeology	3
ANTH 315	Human Genetics and Evolution	3
ANTH 317	Evolutionary Perspectives on Human Adaptation and Behavior	3
ANTH 412	Paleoanthropology	3

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Department Programs

Majors

- Geological Sciences Major, B.A.–Earth Science (http://catalog.unc.edu/undergraduate/programs-study/geological-sciences-major-ba-earth-science-concentration)
- Geological Sciences Major, B.S.–Earth Science (p. 1)
- Geological Sciences Major, B.S.–Environmental Geoscience (http://catalog.unc.edu/undergraduate/programs-study/geological-sciences-major-bs-environmental-geoscience-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)

Student Learning Outcomes

Upon completion of the geological sciences program (B.S.), students should be able to:

- Demonstrate broad knowledge of core geological concepts
- Produce written synthesis of professional journal articles dealing with topics covered in advanced courses
- Make a clear and effective oral presentation
- Apply knowledge and skills from coursework in a significant field experience in an area of geological sciences
- Gain admission to graduate study or obtain employment in a field that uses geological training

Requirements

In addition to the program requirements listed below, students must

- attain a final cumulative GPA of at least 2.0
- 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/#degreerequirementstext).

Code	Title	Hours
Core Requirements		
GEOL 200	The Solid Earth	3
GEOL 201	Earth's Surface: Processes, Landforms, and History	3
13 credit hours from the following options:		13
GEOL 202	Earth Systems History	
GEOL 301	Earth Materials: Minerals	
GEOL 302	Structural Geology	
GEOL 303	Sedimentology and Stratigraphy	
GEOL 304	Petrology and Plate Tectonics	
GEOL 405	Geochemistry	
GEOL 406	Introduction to Geophysics	
GEOL 417/417L	Geomorphology	
Four geology courses numbered above 300 and not otherwise required for the major		12
Capstone requirement (one of the following combinations):		6
GEOL 485 & GEOL 486	Summer Field Course in Geology and Summer Field Course in Geology	
GEOL 691H & GEOL 692H	Honors and Honors	
GEOL 395	Undergraduate Research in Geology (6 credits total)	
Science-oriented Experiential Education (EE) courses. (6 credits total) [1]		
Additional Requirements		
CHEM 101 & 101L	General Descriptive Chemistry I and Quantitative Chemistry Laboratory I	4
CHEM 102 & 102L	General Descriptive Chemistry II and Quantitative Chemistry Laboratory II [H]	4
MATH 231	Calculus of Functions of One Variable I	4
MATH 232	Calculus of Functions of One Variable II	4
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 & 101L	Principles of Biology and Introductory Biology Laboratory [H]	
Any CHEM above CHEM 102		
PHYS 105	General Physics II	
PHYS 115	General Physics II: For Students of the Life Sciences	
PHYS 117	Electromagnetism and Optics [H]	
PHYS 119	Introductory Calculus-based Electromagnetism and Quanta	
At least five science electives not otherwise required for the major (see chart below)		15
Remaining General Education (http://catalog.unc.edu/undergraduate/general-education-curriculum-degree-requirements) requirements and enough free electives to accumulate 122 academic hours		43
Total Hours		122

[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] Must be pre-approved by the Director of Undergraduate Studies.

[2] This course may also be used to satisfy one of the required GEOL courses numbered above 300

Science Electives Not Otherwise Required for the Major

Code	Title	Hours
ANTH 143	Human Evolution and Adaptation	3
ANTH 220	Principles of Archaeology	3
ANTH 315	Human Genetics and Evolution	3
ANTH 317	Evolutionary Perspectives on Human Adaptation and Behavior	3
ANTH 412	Paleoanthropology	3
ANTH 414	Laboratory Methods: Human Osteology	3
ANTH 451	Field School in North American Archaeology [H]	6
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 Environment and Ecology (ENEC) above 201		
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
GEOG 477	Introduction to Remote Sensing of the Environment	3
GEOG 491	Introduction to GIS	3
GEOG 577	Advanced Remote Sensing	3
GEOG 591	Applied Issues in Geographic Information Systems	3
GEOG 592	Geographic Information Science Programming	3
GEOG 594	Global Positioning Systems and Applications	3
GEOG 597	Ecological Modeling	3
any Geological Sciences (GEOL)		
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.

Course descriptions for:

- Astronomy (ASTR) and Physics (PHYS) (http://catalog.unc.edu/undergraduate/departments/physics-astronomy/#coursestext)
- Biochemistry (BIOC) (http://catalog.unc.edu/undergraduate/departments/biochemistry-biophysics/#coursestext)
- Biology (BIOL) (http://catalog.unc.edu/undergraduate/departments/biology/#coursestext)
- Chemistry (CHEM) (http://catalog.unc.edu/undergraduate/departments/chemistry/#coursestext)
- Computer Science (COMP) (http://catalog.unc.edu/undergraduate/departments/computer-science/#coursestext)
- Environment and Ecology (ENEC) (http://catalog.unc.edu/undergraduate/departments/environment-ecology/#coursestext)
- Geography (GEOG) (http://catalog.unc.edu/undergraduate/departments/geography/#coursestext)
- Geological Sciences (GEOL) (http://catalog.unc.edu/undergraduate/departments/geological-sciences/#coursestext)
- Marine Sciences (MASC) (http://catalog.unc.edu/undergraduate/departments/marine-sciences/#coursestext)
- Mathematics (MATH) (http://catalog.unc.edu/undergraduate/departments/mathematics/#coursestext)
- Statistics and Operations Research (STOR) (http://catalog.unc.edu/undergraduate/departments/statistics-operations-research/#coursestext)

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).

GEOLOGICAL SCIENCES MAJOR, B.S.–ENVIRONMENTAL GEOSCIENCE CONCENTRATION

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- Geological Sciences Major, B.S.–Earth Science (http://catalog.unc.edu/undergraduate/programs-study/geological-sciences-major-bs-earth-science-concentration)
- Geological Sciences Major, B.S.–Environmental Geoscience (p. 1)

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)

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- Demonstrate broad knowledge of core geological concepts
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- Apply knowledge and skills from coursework in a significant field experience in an area of geological sciences
- Gain admission to graduate study or obtain employment in a field that uses geological training

In addition to the program requirements listed below, students must

- attain a final cumulative GPA of at least 2.0
- 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/#degreerequirementstext).

Code	Title	Hours
Core Requirements		
All of the following courses:		
GEOL 200	The Solid Earth	3
GEOL 201	Earth's Surface: Processes, Landforms, and History	3
GEOL 324 & 324L	Water in Our World: Introduction to Hydrologic Science and Environmental Problems and Water in Our World Laboratory	4
13 credit hours from the following options:		13
GEOL 301	Earth Materials: Minerals	
GEOL 302	Structural Geology	
GEOL 303	Sedimentology and Stratigraphy	
GEOL 304	Petrology and Plate Tectonics	
GEOL 310	Coastal Environmental Change	
GEOL 405	Geochemistry	
GEOL 417 & 417L	Geomorphology and Geomorphology Laboratory	
GEOL 432	Paleoclimatology	
GEOL 435	Groundwater	
GEOL 436	Geochemistry of Natural Waters	
ENEC 203	Introduction to Environmental Science Problem Solving	
Three geology (GEOL) courses numbered above 300 and not otherwise required for the major		9
Capstone requirement (one of the following combinations):		6
GEOL 485 & GEOL 486	Summer Field Course in Geology and Summer Field Course in Geology	
GEOL 691H & GEOL 692H	Honors and Honors	
GEOL 395	Undergraduate Research in Geology [1]	
Science-oriented Experiential Education (EE) course. [2]		
Additional Requirements		
CHEM 101 & 101L	General Descriptive Chemistry I and Quantitative Chemistry Laboratory I	4
CHEM 102 & 102L	General Descriptive Chemistry II and Quantitative Chemistry Laboratory II [H]	4

MATH 231	Calculus of Functions of One Variable I	4
MATH 232	Calculus of Functions of One Variable II	4
One of the following courses:		3
Any COMP course numbered COMP 110 or above, except COMP 380		
GEOL 520	Data Analysis in the Earth Sciences [3]	
Any MATH above MATH 232		
Any STOR course numbered 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 & 101L	Principles of Biology and Introductory Biology Laboratory [H]	
Any CHEM course above CHEM 102		
PHYS 105	General Physics II	
PHYS 115	General Physics II: For Students of the Life Sciences	
PHYS 117	Electromagnetism and Optics [H]	
PHYS 119	Introductory Calculus-based Electromagnetism and Quanta	
At least five science electives not otherwise required for the major (see below chart)		15
Remaining General Education (http://catalog.unc.edu/undergraduate/general-education-curriculum-degree-requirements) requirements and enough free electives to accumulate 122 academic hours		42
Total Hours		122

[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] Six credits total of independent research.

[2] Must be pre-approved by the Director of Undergraduate Studies.

[3] This course may also be used to satisfy one of the required GEOL courses numbered above 300.

Science Electives Not Otherwise Required for the Major

Code	Title	Hours
ANTH 143	Human Evolution and Adaptation	3
ANTH 220	Principles of Archaeology	3
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ANTH 412	Paleoanthropology	3
ANTH 414	Laboratory Methods: Human Osteology	3
ANTH 451	Field School in North American Archaeology [H]	6
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) COMP 110 or above, except COMP 380		
any Environment and Ecology (ENEC) above ENEC 201		
GEOG 370	Introduction to Geographic Information	3
GEOG 410	Modeling of Environmental Systems	3
GEOG 412	Synoptic Meteorology	3
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GEOG 477	Introduction to Remote Sensing of the Environment	3
GEOG 491	Introduction to GIS	3
GEOG 577	Advanced Remote Sensing	3
GEOG 591	Applied Issues in Geographic Information Systems	3
GEOG 592	Geographic Information Science Programming	3
GEOG 594	Global Positioning Systems and Applications	3
GEOG 597	Ecological Modeling	3
any Geological Sciences (GEOL) course		
any Marine Sciences (MASC) 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) 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.

Course descriptions for:

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- Biology (BIOL) (http://catalog.unc.edu/undergraduate/departments/biology/#coursestext)
- Chemistry (CHEM) (http://catalog.unc.edu/undergraduate/departments/chemistry/#coursestext)
- Computer Science (COMP) (http://catalog.unc.edu/undergraduate/departments/computer-science/#coursestext)
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- Marine Sciences (MASC) (http://catalog.unc.edu/undergraduate/departments/marine-sciences/#coursestext)
- Mathematics (MATH) (http://catalog.unc.edu/undergraduate/departments/mathematics/#coursestext)
- Statistics and Operations Research (STOR) (http://catalog.unc.edu/undergraduate/departments/statistics-operations-research/#coursestext)