

## GEOLOGY AND GEOGRAPHY

Chair: Martin B. Farley

**Faculty:** Jefferson B. Chaumba, Dennis J. Edgell, Amy L. Gross, Daren T. Nelson, Nathan Phillippi, Jesse Rouse

Geography and Geology courses provide the scientific foundation for the investigation and understanding of the physical and cultural environments of the Earth and their interactions. Geography provides the basis for measurement of the physical world, the role of humankind as inhabitant of the dynamic Earth, and the spatial variation of human activity. Geology provides the basis for investigation and understanding of the Earth itself.

The curriculum of the Department of Geology and Geography is designed to fulfill multiple needs of students in learning about this dynamic environment. The B.S. in Geo-Environmental Studies is a flexible, interdisciplinary program that allows students to meet their needs in earth-centered studies. The major provides a base from multiple sciences that is important in understanding the geosciences in an environmental context. Students can choose to concentrate on geology or geography or a mix.

Additional purposes are to provide 1) courses that help all students fulfill General Education requirements; 2) courses for students seeking North Carolina Teacher Licensure in Secondary and Middle Grades Science Education; and 3) courses to broaden the knowledge of students majoring in other disciplines. Courses in Geography can be used to meet General Education requirements in Social Sciences. Courses in Geology can be used to meet General Education requirements in Natural Sciences and Mathematics.

Students in any major can minor or choose an academic concentration in geology or geography. Students seeking a baccalaureate degree in Elementary Education, Special Education, or Physical Education may choose an academic concentration in either Geology or Geography.

### BACHELOR OF SCIENCE IN GEO-ENVIRONMENTAL STUDIES

Requirements for a B.S. Degree in Geo-Environmental Studies	Sem. Hrs.
Freshman Seminar	1
General Education Requirements*	44(29)
Core Major Requirements	
BIO 1000, 3040	7
CHM 1100, 1300	4
GGY 1010 or 1020, 2500, 4100	9
GLY 1000 or 1150, GLYL 1150, GLY 2620	7
MAT 2100	3
PLS 1000	3
GLY 4010 or GGY 4010 or approved field course**	3
Core Total	36
Courses Required for Track	34-35
Geoscience Track	
Geography Track	
Electives	19-20
	<b>Total: 120</b>

\*Fifteen hours of General Education courses are listed separately above as specific core requirements.

\*\* e.g., UNC-CH MAS 472, ECU Geol 4000

#### Geoscience Track

CHM 1110, 1310, 2300	8
GLY 1250, 3100, 3110, GLYL 1250	8
MAT 2150 or 2210	4

**Geoscience Track (Cont.)**

Choose 6 credits from 3000 or higher-level GGY or GLY	6
Choose 9 credits from 2000 or higher-level BIO, ENV, CSC, CHM, PHY, EGR, GLY, GGY; or MAT 2220 or 3000 or higher-level MAT	9
<b>Geoscience Track Total</b>	<b>35</b>

**Geography Track**

GGY 2000, 2460, 2700	10
Choose 6 credits from regional courses GGY 3700, 3720, 3770, 3780, 3790, 3800	6
Choose 6 credits from 3000 or higher-level GGY or GLY	6
Choose 12 credits from 2000 or higher-level AIS, ENV, SOC, CRJ, HST, PLS, WLS, GLY, or GGY	12
<b>Geography Track Total</b>	<b>34</b>

**BACHELOR OF SCIENCE IN SCIENCE EDUCATION (9-12, 6-9)**

Coordinator: Mary Ash, Biology Dept.

Upon successful completion of the program of study in Science Education and related requirements, graduates are eligible for a Standard Professional I license to teach in the State of North Carolina. For a more detailed description, including the program standards and goals and objectives, turn to Undergraduate Licensure Programs in the School of Education section of this catalog.

<b>Course Requirements</b>	<b>Sem. Hrs.</b>
<b>Freshman Seminar and General Education</b>	<b>45(33)*</b>
<b>Content Courses</b> —Select one area of concentration (*12 semester hours of Natural Sciences and Mathematics may count toward General Ed)	
<b>Biology (9-12) Concentration:</b> See Biology Dept. for listing of course requirements.	<b>62</b>
<b>Chemistry (9-12) Concentration:</b> See Biology Dept. for listing of course requirements.	<b>62</b>
<b>Earth Science (9-12) Concentration:</b> See Biology Dept. for listing of course requirements.	<b>62</b>
<b>Physics (9-12) Concentration:</b> See Biology Dept. for listing of course requirements.	<b>62</b>
<b>Middle Grades Science (6-9) Concentration:</b> See Biology Dept. for listing of course requirements.	<b>59</b>
<b>Professional Studies Core</b> EDN 2100, 3130, 3140, SED 3310	<b>12</b>
<b>Content Pedagogy</b> SCE 3000, 3010, 3500 or 4000, 4490, 4750 CSC 4050 EDN 3400 (required only for the 6-9 concentration)	<b>21-24</b>
<b>Total:</b>	<b>128</b>

NOTE: Students who desire teacher licensure in Science Education should declare the major as soon as possible in their college career. Consultation with the Coordinator of Undergraduate Science Education in the Department of Biology prior to registering for General Education courses is strongly recommended.

**ACADEMIC CONCENTRATIONS**

For students seeking a baccalaureate degree in Elementary Education, Special Education, or Physical Education, the Department offers two Academic Concentration options of 24-26 hours each. An Academic Concentration is available to other students, regardless of major.

<b>Required Courses for an Academic Concentration in Geography</b>	<b>Sem. Hrs.</b>
GGY 1020 or 1010, and GGY 2500	
Choose 3 courses from the following: GGY 1150, 2000, 2060, 2460, 2620, 2700	
Choose 3 courses from the following: GGY 3290, 3700, 3720, 3780, 3790, 4010, 4040, 4100, GGYS 4xxx; GLY 3660	
	<b>Total: 24-25</b>

<b>Required Courses for an Academic Concentration in Geology</b>	<b>Sem. Hrs.</b>
GLY 1000 & GLYL 1000 or GLY 1150 & GLYL 1150; GLY 1250 & GLYL 1250	
Choose 6 courses from the following: GLY 2260, 2460, 2620, 3100, 3250, 3660, 4250, GLYS 4xxx; GGY 2500	
	<b>Total: 26</b>

## MINORS

<b>Required Courses for a Minor in Geography</b>	<b>Sem. Hrs.</b>
GGY 1020 or 1010, and GGY 2500	
Choose 2 courses from the following: GGY 1150, 2000, 2060, 2460, 2620, 2700, GGYS 2xxx	
Choose 2 courses from the following: GGY 3290, 3700, 3720, 3770, 3780, 3790, 3800, 4010, 4040, 4100, 4700, GGYS 4xxx	
	<b>Total: 18-19</b>

<b>Required Courses for a Minor in Geology</b>	<b>Sem. Hrs.</b>
GLY 1000 & GLYL 1000 or GLY 1150 & GLYL 1150; GLY 1250 & GLYL 1250	
Choose 4 courses from the following: GLY 2260, 2460, 2620, 3100, 3250, 3660, 4040, 4150, 4250, 4700, GLYS 2xxx, 4xxx; GGY 2500	
	<b>Total: 20</b>

## COURSES

### GEOGRAPHY (GGY)

#### GGY 1010. Principles of Geography (3 credits)

The study of the earth's physical and human geography from a spatial perspective. Techniques and methodology to study interactions between human activities and the physical environment are emphasized.

#### GGY 1020. World Regional Geography (3 credits)

Survey of most countries and regions of the world. An examination of cultures, economies, and physical characteristics as they relate to regional development and contemporary problems in world affairs. Presents an overview of the multicultural earth.

#### GGY 1150. Earth Science (GLY 1150) (3 credits)

The same course as GLY 1150.

#### GGYL 1150. Earth Science Laboratory (GLYL 1150) (1 credit)

The same course as GLYL 1150.

#### GGY 2000. Cultural Geography (3 credits)

Concept of culture applied to the human environment. Geographical variations and evolution resulting from interaction between cultural and physical processes. Culture and technological change. Population and migration. Cultural effects on perception of the environment.

#### GGY 2040. World Geography Bowl (1 credit)

Students will prepare for the NC regional World Geography Bowl through map exercises and discussions on a broad range of Geography topics. May be repeated for credit up to three times. PREREQ: GGY 1010 or 1020.

**GGY 2060. Economic Geography (ECN 2060) (3 credits)**

Geographic analysis of the location, development and distribution of major industries, resources, agricultural products, and economic services. Study of economic development problems and prospects.

**GGY 2460. Weather and Climate (GLY 2460, PHS 2460) (3 credits)**

Study of atmospheric elements and controls, weather analysis and forecasting, and air pollution issues. Also includes a survey of world climate regions and applications of climate data.

**GGY 2500. Introduction to Cartography (3 credits)**

Concepts and skills of map use and interpretation. Cartographic techniques and conventions for production of thematic maps. Basic concepts of geographic information systems and remote sensing.

**GGY 2620. Environmental Geology (GLY 2620) (3 credits)**

The same course as GLY 2620.

**GGY 2700. Introduction to Geographic Information Science**

An introduction to the concepts and uses of GIS technologies and GIScience concepts. Lecture topics include history of GIS, GIS data structures, sources of data, GIS tools, and applications. Lab emphasis will be on spatial data handling in a computer environment; data analysis, production, and information display for planning and decision making.

**GGY 3290. Society and the Environment (3 credits)**

A study of the social aspects of the natural environment. Environmental factors influencing societal development, and ideological conceptions which relate people to their surroundings are explored. The interdependence of culture and physical resources is stressed.

**GGY 3312. Political Geography (PLS 3312) (3 credits)**

An examination of how geography and politics are tied together at a variety of spatial scales and in different global locations. Includes discussions of political geography both within and between states as well as those areas beyond the states, such as the sea and outer space.

**GGY 3700. Geography of Africa (3 credits)**

Examines the historical geography, cultures and physical environments of the African continent. Analysis of current issues and study of economic development problems and prospects.

**GGY 3720. North America (3 credits)**

Analysis of physical and cultural bases of North American geographic patterns. Emphasis upon natural conditions, settlement patterns, and regional structure.

**GGY 3770. Geography of American Indians (3 credits)**

An historical and cultural geography of American Indians from the time of European contact. Will focus upon population dynamics, settlement, patterns, economic development, land use, and physical resources.

**GGY 3780. Geography of Latin America (3 credits)**

Geographical analysis of cultures and environments of Mexico, Central America, Caribbean, and South America. Examination of demographic, political, and economic processes that shape regional development.

**GGY 3790. Geography of Asia (3 credits)**

Geographical analysis of cultures and environments of South Asia, East Asia, and Southeast Asia. Examination of demographic, political, and economic processes that shape regional development.

**GGY 3800. World Prehistory (3 credits)**

This course will provide access to a broad perspective on hominid prehistory around the world from our earliest known ancestors (with focus on ardpithecus and australopithecus) to the transition to protohistory and early history. The course will examine the development of culture across space and through time with a focus on the emergence of cultural hearths in each global region.

**GGY 4010. Internship in Geography (3-4 credits)**

Practical experience with a planning agency through an arranged internship. Supervision is provided by a designated official of the agency and by a member of the department faculty. PREREQ: Permission of instructor.

**GGY 4020. Ground Penetrating Radar (GLY 4020) (1 credit)**

Subsurface remote sensing using ground penetrating radar (GPR). Students will gain experience in the capture and interpretation of GPR data using the instrument and associated software that can be used in a variety of disciplines (e.g. geology, geography, archeology, engineering, etc.). PREREQ: GGY/GLY 1150.

**GGY 4040. Remote Sensing (GLY 4040) (3 credits)**

Remote sensing of Earth's surface. Techniques of photography, multispectral scanning, and microwave imagery from airplane, satellite, and manned-spacecraft platforms. Image interpretation, practical applications in Earth Science, and use of remotely sensed data in Geographic Information Systems.

**GGY 4100. Land Use Planning (3 credits)**

Study of the diverse factors affecting human use of the physical environment. The roles of topography, soils, groundwater, wastewater, streamflow, wetlands, and landscape ecology in environmental land use planning will be considered in detail. PREREQ: GGY 1010 and GGY 2500.

**GGY 4700. Writing in the Geosciences (GLY 4700) (3 credits)**

Development of skill in fundamental communication in the geosciences. Students study methods of communication and research as well as practice presentations. Writing will be addressed as a process involving drafts, revisions, and peer review.

**GGYS 2xxx. General Topics in Geography (1-4 credits)**

This course will focus on a topic of general interest and explore its breadth. The topic will be announced in the schedule of classes. Possible topics include general methodological and topical concepts.

**GGYS 4xxx. Special Topics in Geography (1-4 credits)**

This course will focus on a topic of general interest and explore it in depth. The topic will be announced in the schedule of classes. Possible topics include regional areas or specialized fields. The course may be repeated for a maximum of 6 semester hours.

**GEOLOGY (GLY)****GLY 1000. Physical Geology (3 credits)**

Introduction to earth materials and processes. Topics include minerals and rocks, weathering, landscape formation by streams, glaciers and ocean waves, study of volcanoes, earthquakes and plate tectonics.

**GLYL 1000. Physical Geology Laboratory (1 credit)**

Study of common minerals and rocks; use of topographic and geologic maps. PREREQ: Current enrollment in or completion of GLY 1000.

**GLY 1150. Earth Science (GGY 1150) (3 credits)**

Includes topics in geology, oceanography, meteorology and astronomy. Minerals and rocks, volcanoes, earthquakes; ocean tides and currents, shoreline processes; atmospheric pressure, wind, precipitation, weather patterns; sky observation, solar system.

**GLYL 1150. Earth Science Laboratory (GGYL 1150) (1 credit)**

Study of common minerals and rocks, topographic maps, climate classification, weather processes. PREREQ: Current enrollment in or completion of GLY 1150.

**GLY 1250. Earth History (3 credits)**

Geologic history of the earth as recorded in the rock record. Topics include geologic time, evolution of the atmosphere, continents and oceans, fossils, and the development of life through time.

**GLYL 1250. Earth History Laboratory (1 credit)**

Study of animal and plant fossils, environments of deposition, geologic maps. PREREQ: Current enrollment in or completion of GLY 1250.

**GLY 2260. Oceanography (3 credits)**

Ocean circulation, properties of ocean water, waves and tides, and processes of shoreline erosion and deposition. The relationship between marine processes and human use of coastal areas will be emphasized. PREREQ: GLY 1000 or GLY 1150.

**GLY 2460. Weather and Climate (GGY 2460, PHS 2460) (3 credits)**

The same course as Geography 2460.

**GLY 2620. Environmental Geology (GGY 2620) (3 credits)**

Aspects of geology related to problems arising from intensive use of the earth by modern society. The use of earth materials, energy resources and groundwater will be considered along with land use planning. PREREQ: GLY 1000 or GLY 1150.

**GLY 3100. Minerals and Rocks (3 credits)**

Study of minerals and rocks with an emphasis on origins, classification, and identification. PREREQ: GLY 1000 or GLY 1150 and concurrent enrollment in GLY 3110.

**GLY 3110. Minerals and Rocks Laboratory (1 credit)**

A survey of minerals and rocks with an emphasis on environments of origin, classification, textural features, and identification. Laboratory stresses mineral and rock identification and typical associations. PREREQ: GLY 1000 or GLY 1150 and concurrent enrollment in GLY 3100.

**GLY 3250. Paleontology (3 credits)**

Study of fossil invertebrates, vertebrates and plants with emphasis on evolutionary trends. PREREQ: GLY 1250, GLYL 1250, and BIO 1000.

**GLY 3660. Geomorphology (3 credits)**

Advanced study of land forms-fluvial, solution, glacial, marine, eolian, volcanic, and structural. History of geomorphic theories and regional land forms will also be covered. PREREQ: GLY 1000 or GLY 1150.

**GLY 4010. Geology Internship (3 credits)**

Practical experience with a consulting firm, university, museum, or government agency through a planned internship. Supervision is provided by a designated member of the firm, university, or agency and by a member of the departmental faculty. PREREQ: Departmental approval.

**GLY 4020. Ground Penetrating Radar (GGY 4020) (1 credit)**

Subsurface remote sensing using ground penetrating radar (GPR). Students will gain experience in the capture and interpretation of GPR data using the instrument and associated software that can be used in a variety of disciplines (e.g. geology, geography, archeology, engineering, etc.). PREREQ: GGY/GLY 1150.

**GLY 4040. Remote Sensing (GGY 4040) (3 credits)**

Remote sensing of Earth's surface. Techniques of photography, multispectral scanning, and microwave imagery from airplane, satellite, and manned-spacecraft platforms. Image interpretation, practical applications in Earth Science, and use of remotely sensed data in Geographic Information Systems.

**GLY 4150. Geology Field Trip (1-3 credits)**

Field trip to selected geologic sites to increase appreciation and understanding of geologic, biologic, and cultural resources in areas outside of the UNCP community. A fee is charged to cover travel expenses. Course may be taken for credit up to 3 times. PREREQ: GLY 1150.

**GLY 4250. Stratigraphy and Sedimentology (3 credits)**

Study of environments of deposition of sediments and stratigraphic principles including facies and correlation. Classic examples from the geologic record will be used. PREREQ: GLY 1250.

**GLY 4700. Writing in the Geosciences (GGY 4700) (3 credits)**

Development of skill in fundamental communication in the geosciences. Students study methods of communication and research as well as practice presentations. Writing will be addressed as a process involving drafts, revisions, and peer review.

**GLYS 2xxx. General Topics in Geology (1-4 credits)**

This course will focus on a topic of general interest and explore its breadth. The topic will be announced in the schedule of classes. Possible topics include general methodological and topical concepts.

**GLYS 4xxx. Special Topics in Geology (1-4 credits)**

This course will focus on a topic of general interest and explore it in depth. The topic will be announced in the schedule of classes. Possible topics include dinosaurs, natural disasters, etc. The course may be repeated for a maximum of 6 semester hours.