

# GEOLOGY, ENVIRONMENTAL GEOLOGY CONCENTRATION (BS IN GEOLOGY)

## The Geology Program

The program of the Department of Geology is designed to provide each major with a strong, broad background in geology that is sufficiently flexible to allow students freedom to follow their own interests. The major may choose one of two options, either general geology or environmental geology. Ample opportunity is available for independent student research and such research is an integral part of the curriculum regardless of the option chosen.

The geologic setting of Williamsburg enhances the program in geology and offers a wide variety of areas for field study. Situated on the Coastal Plain with its excellent exposures of sediments and fossils, the College is only 50 miles from the Fall Zone beyond which are the igneous and metamorphic rocks of the Piedmont. The Blue Ridge and Valley & Ridge areas of the Appalachian Mountains are within a three-hour drive. Thus the field study area includes all major rock types and representatives of most geologic time periods from Precambrian to Holocene.

## Course Requirements

| Code                                                      | Title                                                                                                          | Hours     |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------|
| <b>Introductory Sequence</b>                              |                                                                                                                |           |
| Select one of the following options:                      |                                                                                                                | 4-5       |
| GEOL 101 & GEOL 160                                       | The Dynamic Earth: Physical Geology and Investigating the Earth: Introductory Geology Laboratory               |           |
| GEOL 110 & GEOL 160                                       | Earth's Environmental Systems: Physical Geography and Investigating the Earth: Introductory Geology Laboratory |           |
| GEOL 150 & GEOL 160                                       | First-Year Seminar and Investigating the Earth: Introductory Geology Laboratory                                |           |
| GEOL 250                                                  | Geologic Evolution of VA                                                                                       |           |
| <b>Core Courses</b>                                       |                                                                                                                | <b>18</b> |
| GEOL 321                                                  | Rock-Forming Minerals                                                                                          |           |
| GEOL 323                                                  | Earth Structure & Dynamics                                                                                     |           |
| Select at least one course from Group A:                  |                                                                                                                |           |
| GEOL 315                                                  | Hydrology                                                                                                      |           |
| GEOL 316                                                  | Environmental Geochemistry                                                                                     |           |
| GEOL 320                                                  | Earth Surface Processes                                                                                        |           |
| GEOL 327                                                  | Igneous and Metamorphic Petrology                                                                              |           |
| Select at least one course from Group B:                  |                                                                                                                |           |
| GEOL 322                                                  | The Sedimentary Record                                                                                         |           |
| GEOL 324                                                  | Paleoclimatology & Paleoceanography                                                                            |           |
| GEOL 325                                                  | Paleontology                                                                                                   |           |
| Select two to four additional credits from Group A and B: |                                                                                                                |           |
| GEOL 324                                                  | Paleoclimatology & Paleoceanography                                                                            |           |
| GEOL 325                                                  | Paleontology                                                                                                   |           |
| GEOL 327                                                  | Igneous and Metamorphic Petrology                                                                              |           |

|                                                                              |                                                                                                  |              |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------|
| GEOL 315                                                                     | Hydrology                                                                                        |              |
| GEOL 316                                                                     | Environmental Geochemistry                                                                       |              |
| GEOL 320                                                                     | Earth Surface Processes                                                                          |              |
| GEOL 322                                                                     | The Sedimentary Record                                                                           |              |
| <b>Research</b>                                                              |                                                                                                  | <b>5-6</b>   |
| GEOL 404                                                                     | Introduction to Geological Research                                                              |              |
| Select one of the following:                                                 |                                                                                                  |              |
| GEOL 491 & GEOL 492                                                          | Senior Research and Senior Research                                                              |              |
| GEOL 495 & GEOL 496                                                          | Honors and Honors                                                                                |              |
| <b>Elective Courses</b>                                                      |                                                                                                  | <b>9</b>     |
| Select nine credits from the following:                                      |                                                                                                  |              |
| GEOL 212                                                                     | Global Climate Change                                                                            |              |
| GEOL 305                                                                     | Environmental Geology                                                                            |              |
| GEOL 314                                                                     | Watershed Dynamics                                                                               |              |
| GEOL 428                                                                     | Geochemistry Seminar                                                                             |              |
| GEOL 429                                                                     | Hydrology Seminar                                                                                |              |
| GEOL 437                                                                     | Special Topics Seminar                                                                           |              |
| GIS 201                                                                      | Introduction to Geographic Information Systems and Spatial Analysis                              |              |
| Additional courses from Group A and B can also be used for elective credits. |                                                                                                  |              |
| <b>Biology Requirement</b>                                                   |                                                                                                  |              |
| Select one of the following:                                                 |                                                                                                  | 3-4          |
| BIOL 204                                                                     | Introduction to Organisms, Ecology, Evolution                                                    |              |
| BIOL 318                                                                     | Conservation Biology                                                                             |              |
| BIOL 417                                                                     | Population and Community Ecology                                                                 |              |
| BIOL 426                                                                     | Aquatic Ecology                                                                                  |              |
| BIOL 427                                                                     | Wetland Ecosystems                                                                               |              |
| BIOL 461                                                                     | Marine Ecology and Conservation                                                                  |              |
| ENSP 440                                                                     | Special Topics in Environmental Science and Policy                                               |              |
| <b>Additional Requirements</b>                                               |                                                                                                  |              |
| GEOL 314                                                                     | Watershed Dynamics (but not both) <sup>1</sup>                                                   |              |
|                                                                              | or GEOL 315 Hydrology                                                                            |              |
| Select two of the following: <sup>2</sup>                                    |                                                                                                  | 8            |
| CHEM 103 & 103L                                                              | General Chemistry I and General Chemistry Lab I                                                  |              |
| CHEM 206 & 206L                                                              | Organic Chemistry I and Organic Chemistry Lab I                                                  |              |
| CHEM 208 & CHEM 254                                                          | General Chemistry II and Introduction to Inorganic Chemistry and General Chemistry Laboratory II |              |
| PHYS 101 & 101L                                                              | General Physics-Lecture and General Physics-Lab                                                  |              |
| PHYS 102 & 102L                                                              | Gen Physics-Lecture and General Physics-Lab                                                      |              |
| <b>Total Hours</b>                                                           |                                                                                                  | <b>47-50</b> |

## Major Computing Requirement

Fulfilled by completing the Research requirement outlined above.

## Major Writing Requirement

Fulfilled by completing the Research requirement outlined above.

<sup>1</sup> Environmental Geology majors must take EITHER GEOL 314 Watershed Dynamics or GEOL 315 Hydrology, but not both. Depending on the topic, GEOL 437 Special Topics Seminar may be used to satisfy this requirement with permission of the chair.

<sup>2</sup> These courses are required but do not count towards the minimum 36 credits in geology. Geology majors, especially those planning on pursuing advanced degrees, are strongly recommended to take one year of calculus, one year of chemistry, one year of physics, and a field camp.