GEOL 1001. Physical Geology. 4 Credits.
Introduction to the principal features of the composition and structure of the earth. The nature of minerals and rocks, surface and deep earth processes, mineral and energy resources, and plate tectonics.

GEOL 1002. Historical Geology. 4 Credits.
Lecture and laboratory. Introduction to the history of the earth. Sedimentary environments, plate tectonics, origin of life, and evolution.

GEOL 1005. Environmental Geology. 4 Credits.
Lecture and laboratory. Introduction to the impact of geology on the environment, with emphasis on the relation of people and society to natural environments. Population evolution, natural hazards, and mineral resources.

GEOL 2111. Mineralogy. 4 Credits.
Lecture and laboratory. Introduction to the crystallography and chemical systematics of rock-forming and ore minerals. Exercises emphasize the analysis of mineralogic data and the paragenesis of mineral assemblages. Prerequisites: GEOL 1001, or GEOL 1002, or GEOL 1005.

GEOL 2112. Igneous and Metamorphic Petrology. 4 Credits.
Lecture and laboratory. Introduction to basic light theory and the identification and characterization of minerals through optical properties. Laboratory exercises provide an introduction to petrologic analysis of igneous and metamorphic mineral systems. Prerequisite: GEOL 2111 or permission of the instructor. Laboratory fee.

GEOL 2122. Structural Geology. 3 Credits.
Study of natural and experimental rock deformation and the relationships between stress and strain as recorded by geologic structures. Prerequisites: GEOL 1001 or GEOL 1002 or GEOL 1005.

GEOL 3123. Crustal Dynamics. 3 Credits.
Basic plate tectonic processes and features; the plate tectonic paradigm in historical evolutionary framework. Students present an original research project orally and in writing. Prerequisite: GEOL 2122. Laboratory fee.

GEOL 3128. Sedimentology and Stratigraphy. 3 Credits.
Introduction to sedimentation and stratigraphy; origin and classification of sediments and sedimentary rocks; introduction to clastic and carbonate depositional environments and stratigraphic principles. Prerequisites: GEOL 1001, or GEOL 1002, or GEOL 1005.

GEOL 3129. Sedimentology and Stratigraphy Lab. 1 Credit.
Introduction to sedimentary petrology of sandstones, mudrocks, and carbonates. Prerequisites: GEOL 2112.

GEOL 3131. Global Climate Change. 3 Credits.
Fundamental causes and patterns of climate change. Methods of reconstruction of past climates; modeling and predicting climate change.
GEOL 3138. Hydrogeology. 3 Credits.
Principles and theory of basic applied hydrology: surface water hydrology, geology of groundwater systems, groundwater flow, surface water–groundwater interactions, contamination and remediation technologies, conservation, management and regulations. Prerequisites: GEOL 1001, or GEOL 1002, or GEOL 1005.

GEOL 3140. Geochemistry. 3 Credits.
Chemical systems and processes on the planet Earth; origins and interactions among and within the Earth’s lithosphere, oceans, and atmosphere; origin, distribution, and behavior of the elements; radioactive and stable isotope systems. Aqueous geochemistry; geochemical cycles. Prerequisites: GEOL 1001 or GEOL 1005; and CHEM 1111 and CHEM 1112. (Same as CHEM 3140)

GEOL 3189. Geophysics. 3 Credits.
Principles of magnetic, gravity, seismic and electrical methods applied to geological problem-solving. Prerequisite: GEOL 2122 or permission of instructor.

GEOL 3191. Geology of Energy Resources. 3 Credits.
Principles of geology applied in energy exploration, exploitation, and production. The geology and regulation of energy resources. Sustainability, efficiency, supply chain, and conservation issues. Prerequisites: GEOL 1001, or GEOL 1002, or GEOL 1005.

GEOL 4195. Geological Field Methods. 4 Credits.
Weekend field trips. Methods of outcrop analysis, geologic mapping, and data interpretation. The geological evolution of the central Appalachian mountains and the plate tectonic processes responsible for their formation emphasized. Field trip fee. Prerequisites: GEOL 2111 and GEOL 2122.

GEOL 4195W. Geological Field Methods. 4 Credits.
Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement.

GEOL 4199. Undergraduate Research or Reading. 1-12 Credits.
Problems approved by the staff. May be repeated for credit.

GEOL 5099. Variable Topics. 1-99 Credits.