

Lehman College, City University of New York  
**DEPARTMENT OF EARTH, ENVIRONMENTAL, AND GEOSPATIAL SCIENCES**

**LEARNING GOALS AND OBJECTIVES**

**EARTH SCIENCE**

Upon completion of the Bachelor of Science degree in Earth Science, graduates will be able to:

**Goal I – Understand the origin of Earth and its evolution over geological time**

Learning Objectives

To achieve this goal, students will be able to:

- A. Communicate our current understanding of the origin of the solar system and Earth
- B. Describe the evolution of the early Earth
- C. Summarize the Principles of Biological Evolution, Plate Tectonics, and Climate
- D. Describe the Relationship between Paleogeography (Plate Tectonic), Climate Change, and Biological Evolution
- E. Trace the Chronology of major steps or events in the evolution of Paleogeography, Climate and Biology

**Goal II – Understand the physical and chemical nature of the Earth system**

Learning Objectives

To achieve this goal, students will be able to:

- A. Describe the composition and structure of Oceans
- B. Describe the composition and structure of Continents
- C. Describe the composition and structure of Atmosphere and Climate
- D. Describe the composition and structure of Hydrosphere
- E. Describe the composition and structure of Biosphere

**Goal III – Understand the structure and organization of the Earth system components and the physical, chemical and biological processes (biochemical cycles) and interconnect them.**

Learning Objectives

To achieve this goal, students will be able to:

- A. Identify and describe the major biogeochemical cycles – tectonic, rock, hydrologic (nitrogen, carbon)
- B. Summarize the nature of cycles – transfer of energy and matter, reservoirs, fluxes
- C. Explain the interconnectivity of biogeochemical cycles

#### **Goal IV – Develop the skill required for geosciences careers**

##### Learning Objectives

To achieve this goal, students will be able to:

- A. Read, analyze and interpret maps and other science visualization media
- B. Use maps as a visualization tool for various types of data
- C. Employ mapping and geotechnical instrumentation in field work analysis
- D. Demonstrate the ability to collect, record and archive data
- E. Synthesize information from multiple sources (maps, quantitative data, and text).

#### **Goal V – Understand the nature of geosciences and its historical development**

##### Learning Objectives

To achieve this goal, students will be able to:

- A. Apply the fundamental principles and laws of geology
- B. Describe the Unifying Theory of Plate Tectonics
- C. Summarize the historical development of the science of geology
- D. Describe the social, political, and economic context of geosciences throughout history

#### **Goal VI – Understand the roles and relationships of human beings within the Earth System**

##### Learning Objectives

To achieve this goal, students will be able to:

- A. Assess the human impact on biogeochemical systems
- B. Evaluate how geosciences careers can impact society
- C. Analyze the health, societal, and economic impacts of geological hazards
- D. Explain the Interdisciplinary nature of geosciences and connectivity with other disciplines