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