

ENSC-203: Introduction to Earth Sciences (Theory)

(02 Credit hrs)

PRE-REQUISITE: F.Sc. or equivalent

LEARNING OUTCOMES

- This course will provide an introduction to the Geology to the students.
- The students will learn about the Rocks and Minerals.
- They will have the knowledge about the occurrences and importance of Geology.
- The students will get used to the different Geological Features.

CONTENTS

Unit-1: Introduction

- 1.1. Evolution of the Geologic Time Scale
- 1.2. Internal Structure of the Earth
- 1.3. Earth's Four Spheres

Unit-II: Igneous Rocks

- 2.1. Magma, Plutonic and Volcanic Rocks,
- 2.2. Formation and Structure of Igneous Rocks
- 2.3. Textures and Classification of Igneous Rocks

Unit-III: Weathering, Soil and Erosion

- 3.1. Weathering, Erosion, Transportation
- 3.2. Types of Weathering
- 3.3. Mechanical Weathering
- 3.4. Chemical Weathering

Unit-IV: Sediments and Sedimentary Rocks

- 4.1. Sediments and Formation of Sedimentary Rocks
- 4.2. Types and Structures of Sedimentary Rocks
- 4.3. Textures of Sedimentary Rocks and Sedimentary Environments.

Unit-V: Metamorphism and Metamorphic Rocks

- 1.1. Causes and Consequences of Metamorphic Rocks
- 1.2. Formation and Types of Metamorphic Rocks
- 1.3. Structures and Textures of Metamorphic Rocks
- 1.4. Grades of Metamorphism and Metamorphic Facies

Unit-VI: Mass Wasting

- 1.1. Definition of Mass Wasting and Role of Water
- 1.2. Factors that Control Mass Wasting and Types of Mass Wasting
- 1.3. Mass Wasting Triggered by Earthquakes and Volcanoes and its Prediction

Unit-VII: Streams

- 7.1. Hydrological Cycle, Types and Sources of Streams
- 7.2. Characteristics of Streams, Perennial and Non-Perennial Streams
- 7.3. Drainage Basins, Crossings, Ability of Streams to Erode, Transport and Deposit Sediments

Unit-VIII: Plate Tectonics

- 8.1. Alfred Wegener and Origin of Idea, Rock Magnetism, Apparent Polar Wandering
- 8.2. Continental Drift, Sea Floor Spreading, Plates and Plate Tectonics
- 8.3. Divergent Plate Boundary, Convergent Plate Boundary, Transform Plate Boundary
- 8.4. Anatomy of a Plate, Causes of Plate Motion

Unit-IX: Deserts and Wind Action

- 9.1. Etymology and Types of Deserts
- 9.2. Weathering and Erosional Processes in Deserts, Depositional Environments in Deserts
- 9.3. Desert Landscape and Desertification
- 9.4. Physical, Ecology and Biogeography of Deserts

Unit-X: Glaciers and Glaciations

- 1.1. Introduction, Types, Formation of Glaciers
- 1.2. Glaciers of the World, Structure and Movement of the Glaciers
- 1.3. Glacial Erosion, Landform created by Glacial Deposition
- 1.4. The Ice Ages, Glacial Geology, Climate Change

Unit-XI: Mountains

- 11.1. Definition, Geology and Climate of Mountains
- 11.2. Mountains and Mountains Ranges, Plate Tectonics and Mountain Building
- 11.3. Deformation and Ruptures of Rocks, Geologic Structures
- 11.4. Island ARCS, The Building of Two Mountains Chains: Andes and Himalayas

Unit-XII Oceans and Coastlines

- 12.1. The Origin of Ocean, The Earth's Ocean, Oceans Currents
- 12.2. Physical Properties, Chemical Composition of Seawater
- 12.3. Studying the Features, Sediments and Rock of Sea Floor, Continental Margins, Sea Water
- 12.4. The Sea Coast, Size, Formation, Types of Coastlines
- 12.5. Emergent and Submergent Coastlines, Beaches, Life in Sea, Mid Oceanic Ridges

TEACHING – LEARNING STRATEGIES

- Lecture based examination
- Presentation/seminars
- Class discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.