

NATIONAL INSTITUTE OF GEOLOGICAL SCIENCES
COLLEGE OF SCIENCE
UNIVERSITY OF THE PHILIPPINES, DILIMAN, QUEZON CITY

GEOLOGY 11: Principles of Geology

Course Outline

1. INTRODUCTION

- 1.1 What is geology?
- 1.2 Branches of geology
- 1.3 Uniformitarianism and catastrophism

2. THE PLANET EARTH

- 2.1 A hypothesis on the formation of the earth: The Nebular Hypothesis
- 2.2 Size and shape of the earth
- 2.3 Earth's large-scale features
- 2.4 Earth's internal structure and features
- 2.5 Isostasy: Pratt's and Airy's Theories of Isostasy

Activity: Film showing and seat/homework

3. MINERALS

- 3.1 What is a mineral?
- 3.2 Physical properties of minerals
- 3.3 Classification of minerals
- 3.4 The Silicate Group of minerals
- 3.5 Common rock-forming minerals
- 3.6 Minerals as a non-renewable resource

Activity: Crystal making and mineral Identification

4. IGNEOUS ROCKS

- 4.1 What is magma?
- 4.2 Origin and formation of magma
- 4.3 Formation of igneous rocks
- 4.4 Classification of igneous rocks
- 4.5 Resources from igneous rocks

Activity: Rock identification

5. VOLCANISM

- 5.1 Eruption styles
- 5.2 Volcanic landforms
- 5.3 Volcanic hazards
- 5.4 Geothermal energy
- 5.5 Special topic: The June 1991 Mt. Pinatubo eruption

1st LONG EXAM

6. SEDIMENTARY ROCKS

- 6.1 Weathering
- 6.2 Erosion, deposition and lithification
- 6.3 Classification of sedimentary rocks
- 6.4 Common sedimentary structures
- 6.5 Resources from sedimentary rocks

Activity: Rock identification

7. SEDIMENTARY ENVIRONMENTS

- 7.1 Fluvial environment
- 7.2 Transitional environment
- 7.3 Marine environment

Activity: Film showing and the Wentworth Scale

8. GROUNDWATER

- 8.1 Distribution of underground water
- 8.2 Porosity and permeability
- 8.3 Springs and artesian wells
- 8.4 Geologic work of groundwater
- 8.5 Problems associated with groundwater

9. MASS WASTING

- 9.1 What is mass wasting?
- 9.2 Factors promoting mass wasting
- 9.3 Classification of mass wasting processes
- 9.4 Hazards and some mitigation measures

Activity: Film showing for groundwater and mass wasting

2nd LONG EXAM

10. METAMORPHIC ROCKS

- 10.1 What is metamorphism?
- 10.2 Types of metamorphism
- 10.3 Classification of metamorphic rocks
- 10.4 Resources from metamorphic rocks
- 10.5 Recap: The Rock Cycle

Activity: Rock identification

11. ROCK DEFORMATION

- 11.1 Stress and strain
- 11.2 Structures due to brittle deformation
- 11.3 Structures due to plastic deformation
- 11.4 Special topic: Maps as Geologic Tools

Activity: Topographic map reading and interpretation

12. EARTHQUAKES

- 12.1 What Is an Earthquake?
- 12.2 Elastic Rebound Theory
- 12.3 Focus and epicenter
- 12.4 Seismic waves
- 12.5 Magnitude and intensity
- 12.6 Earthquake hazards
- 12.7 Predicting Earthquakes
- 12.8 Seismic waves and the interior of the earth

Activity: Locating epicenters

13. PLATE TECTONICS

- 13.1 Continental drift
- 13.2 Sea-floor spreading
- 13.3 Theory of Plate Tectonics
- 13.4 Types of plate boundaries
- 13.5 Mechanisms for plate motions
- 13.6 Philippine tectonics

14. HISTORICAL GEOLOGY

- 14.1 Geologic time
- 14.2 Relative dating and absolute dating
- 14.3 Fossils
- 14.4 The Geologic Time Scale

Activity: Film showing and geologic history interpretation

3rd LONG EXAM

GRADE COMPUTATION:

Passing score = 60 %

Final grade = $\frac{2}{3}$ pre-Final grade + $\frac{1}{3}$ Final exam

where,

pre-Final grade = $\frac{2}{3}$ long exams + $\frac{1}{3}$ other requirements

other requirements: quizzes, recitations, class activities, assignments, etc.