



NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF GEOLOGICAL, MINING AND METALLURGICAL
ENGINEERING
GEOLOGICAL ENGINEERING PROGRAM

GE434 – PETROLOGY OF SEDIMENTARY ROCKS

I. GENERAL INFORMATION

CODE	: GE434 Petrology of Sedimentary Rocks
SEMESTER	: 7
CREDITS	: 3
HOURS PER WEEK	: 5 (Theory–Practice–Laboratory)
PREREQUISITES	: GE153 Petrography, GE155 Microscopy.
CONDITION	: Compulsory
DEPARTMENT	: Geological Engineering

II. COURSE DESCRIPTION

The course prepares students for the analysis of the genesis of sedimentary rocks. The origin, classification, and occurrence of sedimentary rocks are analyzed. The petrography of sedimentary rocks is described at macroscopic and microscopic levels. Geophysical and geochemical properties of sedimentary rocks are analyzed and interpreted.

III. COURSE OUTCOMES

At the end of the course, students:

1. Organize the basic concepts and the phases of a petrologic study.
2. Understand the scope and applications of diagenesis.
3. Recognize sedimentary rocks: silici-clastics, carbonate rocks, siliceous rocks, evaporite rocks, phosphorite and volcano-sedimentary rocks.

IV. LEARNING UNITS

1. INTRODUCTION

Basic concepts / Phases of a petrologic study / Documentation and study of the geological context / Fieldwork and sampling / Preliminary petrographic study / Origin, classification, and occurrence of sedimentary rocks.

2. PETROGRAPHIC DESCRIPTIONS

Study of chemical composition / Study of isotopic composition / Petrological interpretations. / Geotectonic framework / Depositional environments.

3. SEDIMENTARY STRUCTURES

Processes that control the composition of sedimentary rocks. / Groups of sedimentary rocks / Sedimentary textures / Sedimentary structures / Sandstones / Conglomerates / Mudstones and shales / Provenance of silici-clastic sedimentary rocks.

4. OVERVIEW OF DIAGENESIS

Introduction / Study of diagenesis / Related solutions / Diagenesis of sandstones and shales / Diagenesis of carbonate rocks.

5. DECOMPOSITION OF ORGANIC MATERIAL AND ITS IMPACT ON THE CHEMISTRY OF WATER

Maritime water evolution connoted during the geo-diagenesis / Stability of minerals / Cementation.

6. ROCKS

Silici-clastic rocks / Carbonated rocks. Limestones. Dolomites. Diagenesis of carbonate rocks / Siliceous rocks / Evaporite rocks / Phosphorite rocks / Volcano-sedimentary rocks / Cherts / Iron-rich sedimentary rocks.

V. LABORATORY

1. Practice 1: Recognition of representative rocks of the four groups / Main minerals forming sedimentary rocks / Alchemical beads / Matrix and cement / Porosity and permeability / Textures of rocks sedimentary.
2. Practice 2: Petrography of silici-clastic rocks / Petrography of carbonate rocks / Petrography of siliceous rocks.
3. Petrography of evaporite rocks / Petrography of phosphorite rocks / Petrography of tufites.

VI. METHODOLOGY

The course will be taught under the modality consisting of theory, practice and computer laboratory sessions. In theory sessions, the teacher presents concepts, theorems and applications. In practice sessions, diverse real problems are solved and their solution analyzed. At the end of the course the student should present and expose a project. Student's active participation is promoted.

VII. GRADING FORMULA

The Final Grade PF is calculated as follow:

$$PF = PP$$

PP: Average of the best 75% of practical works.

VIII. BIBLIOGRAPHY

1. SAM BOGGS.
Petrology of Sedimentary Rocks. Second edition, JR. University of Oregon, 2016
2. Maurice E. Tucker BSc, PhD, FGS.
Sedimentary Petrology an Introduction to the Origin of Sedimentary Rocks. Department of Geological Sciences. University of Durham, 2016