



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

GEOLOGICAL ENGINEERING PROGRAM

GE312 – PALEONTOLOGY

I. GENERAL INFORMATION

CODE	: GE312 Sedimentology
SEMESTER	: 5
CREDITS	: 4
HOURS PER WEEK	: 6 (Theory – Practice)
PREREQUISITES	: GE001 Geology
CONDITION	: Compulsory

II. COURSE DESCRIPTION

The course prepares students in the theoretical fundamentals and practice of paleontology, fossils and fossilization process. Students analyze the formation of fossil deposits and the description of fossils based on the morpho-types in animal and plant kingdoms in continental and marine ecosystems. Students also appraise the scientific, technological and economic importance of fossils, their uses and applications.

III. COURSE OUTCOMES

At the end of the course, students:

1. Organize sedimentary materials of earth crust in formation unit according to the paleontological records and time dependent qualities.
2. Explain the paleo-biodiversity based on fossil records.
3. Understand the evolution of different fossil records based on Geological Time Table.
4. Interpret the presence or absence of fossils in stratigraphic records.
5. Construct a geological time scale based on the recognition of characteristic fossils.
6. Identify fossil primary types as time markers.
7. Analyze the presence of fossils in rocky stratum according to a taphonomic criterion.

IV. LEARNING UNITS

1. THEORETICAL FUNDAMENTALS

Paleontology / Evolution and present state / Division of paleontology / Paleontological principles and laws / Origin and evolution of life on Earth / Fossils / Organism nature, place and existence modes / Fossil records / Fossil types and classes / Stratigraphic value / Fossilization / Sedimentary means, grounding and preservation conditions / Formation process of paleontological deposits: Taphocenosis / Fossilization types / Methodology of paleontological research.

2. PALEONTOGENESIS

Fossil formation / Sedimentary processes / Generator mean, materials transport and receptor mean / Taphonomy and associated processes / Biostratigraphy and bioturbation / Analysis of outcrops and reconstructions / Biofacies and organic indicators.

3. PALEONTOGRAPHY

Description of morphotypes / Concepts and definitions: species, ontogenetical variation, taxonomy and nomenclature / Study of invertebrate fossils: fossilizable parts, Peruvian examples

/ Phyla Porifera, Cnidaria, Bryozoa, Brachiopoda, Mollusca, Arthropoda, Echinodermata, Hemicordata, Anelida / Study of plant fossils: generalities and Peruvian examples / Study of vertebrate fossils: generalities and Peruvian examples / Study of ichnology / Recognition of fossil traces, examples and applications.

V. LABORATORY AND PRACTICAL EXPERIENCES

1. Recognition of fossils forms and types, and fossilization. Recognition of main typical fossils of Peru.
2. Recognition of alioctone fossil accumulation and preferred orientation in stratum.
3. Methodology for paleontographic analysis and comparison. Specimen comparison. Drawing

VI. METHODOLOGY

The course takes place in theory, practice, laboratory and field study sessions. In theory sessions faculty presents concepts and methods. In practice sessions, students analyze and solve diverse problems related to paleontology, fossil records, taxonomic character and dimensions. In laboratory and field study sessions, students analyze samples and formulate conclusions. Students present written reports summarizing their findings and conclusions. Active student participation is promoted.

VII. EVALUATION FORMULA

The average grade PF is calculated as follows:

$$PF = PP$$

PP : Average grade of practice, laboratory and field study work.

VIII. BIBLIOGRAPHY

1. **PATZKOWSKY M., HOLLAND S.**
Stratigraphic Paleobiology. Fossil Distribution in Time and Space.
University of Chicago Press, 2012.
2. **MARTINEZ L., RIVAS P.**
Invertebrate Paleontology
Geological and Mining Institute of Spain, 2010.
3. **CAMACHO H., LONGOBUCCO M.**
Invertebrate Fossils
Maimonides University, Argentina, 2011..