

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE  
SCHOOL OF ENGINEERING  
DEPARTMENT OF STRUCTURAL AND GEOTECHNICAL ENGINEERING  
ABET COURSE SYLLABI

**ICE2022      STRATIGRAPHY AND VOLCANIC-SEDIMENTARY PROCESSES**

**Credits and contact hours:** 10 credits / 10 hours (3 h. Lectures; 3 h. Labs; 4 h. Independent learning experiences)

**Instructor's name:** To be defined.

**Course coordinator's name** To be defined

**Textbook:**

- Miall, A. (1997) The geology of stratigraphic sequences. Springer-Verlag, Berlín.
- Walker, R.; James, N. (1992) Facies models: response to sea level changes. Geol. Assoc., Canadá.

**Course Catalog Description:** This course is planned to be taught since 2015. In it, students will be able to identify, describe and classify stratified rocks and comprehend the geological processes that produce volcanic and sedimentary facies. The main models of continental and marine systems, physical stratigraphy and human activity applications are studied. It includes facies and paleoenvironments analysis, and physicochemical parameters that govern the formation, transportation and deposition of rocks and volcanic and volcanoclastic deposits.

**Prerequisite Courses:** ICE2028 Mineralogy and petrology and ICE2633 Structural geology and tectonics

**Co-requisite Courses:** None

**Status in the Curriculum:** Required

**Course Learning Outcomes:**

1. Identify, describe and classify stratified rocks.
2. Apply the methods and study techniques of the facies analysis and sedimentary and volcanic rock sequences.
3. Identify geological processes that produce sedimentary and volcanic facies.
4. Recognize and comprehend the paleoenvironment of sedimentary and volcanic rocks.

**Relation of Course to ABET Criteria:**

- d. Multidisciplinary teams
- f. Professional and ethical responsibility
- g. Effective communication
- h. Broad education necessary for global, economic, environmental and societal context
- j. Knowledge of contemporary issues

**Topics covered:**

1. Basic principles for stratigraphy and sedimentology.
2. Processes and sedimentary rocks.
3. Processes and volcanic rocks.
4. Stratified rocks evaluation methods.
5. Geological absolute and relative timing.
6. Sedimentary and volcanic structures.
7. Sedimentary and volcanic environments.
8. Analysis of facies (litofacies, biofacies, seismic facies)
9. Stratigraphic nomenclature.
10. Stratigraphic correlations.
11. Sequential stratigraphy.
12. Tectonics, sedimentation and volcanism on converging margins: basin analysis.
13. Sedimentary and volcanic rock classification, texture and structure.
14. Stratigraphic profiles.
15. Stratigraphic columns based on profile and probing data.
16. Documentation and determination of facies.
17. Stratigraphic column correlations.
18. Stratigraphic and Volcanic maps.