

Course guide

250342 - RECMINENER - Mineral and Energy Resources

Last modified: 16/11/2022

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 1004 - UB - (ENG)Universitat de Barcelona.

Degree: BACHELOR'S DEGREE IN GEOLOGICAL ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2022 **ECTS Credits:** 4.5 **Languages:** Catalan

LECTURER

Coordinating lecturer: M. ÀNGELS CANALS SABATÉ

Others: M. ÀNGELS CANALS SABATÉ, MARIANO MARZO CARPIO, ALBERTO SÁEZ RUÍZ

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

4032. Design, planning and execution of projects for prospecting for and extracting minerals, rocks, fossil and nuclear fuels, and groundwater, and geotechnical projects. Students will learn to design, plan and carry out fluid injections into underground structures.

4034. Drilling and support techniques for underground and surface works

4045. Deposit modelling

Transversal:

592. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.

595. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.

599. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

602. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

584. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

TEACHING METHODOLOGY

The course consists of 0 hours per week of classroom activity (large size group).

The 0 hours in the large size groups are devoted to theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises.

Support material in the form of a detailed teaching plan is provided using the virtual campus ATENEA: content, program of learning and assessment activities conducted and literature.

Although most of the sessions will be given in the language indicated, sessions supported by other occasional guest experts may be held in other languages.

LEARNING OBJECTIVES OF THE SUBJECT

Students will acquire an understanding of mineral and energy resources and learn to apply this knowledge to technological scientific problems and applied technological problems.

- Upon completion of the course, students will be able to:
1. Understand the principal processes in the formation of mineral deposits and relate the geological, mineralogical, geochemical and structural characteristics of a mineral deposit to its descriptive geo-environmental model;
 2. Identify the principal mineral components of different types of deposit with the naked eye and in microscope images, establish the relationship between the components found and the formation conditions, determine the potential environmental impact of their use in engineering and produce mineral deposit maps;
 3. Take environmental and other decisions applicable to real examples of mineral resource use.

General characteristics of the principal types of metallic mineral deposits and the processes used in the generation, transport and concentration of the required elements; Principal descriptive models of mineral deposits; Socioeconomic importance of the study of mineral resources; Principal methods for studying mineral deposits; Orthomagmatic deposits, hydrothermal deposits and deposits associated with sedimentary processes; Structures of geoenvironmental mineral deposit models; Identification of the paragenesis of the principal types of mineral deposits with the naked eye and reflected light microscopy; Deposit modelling; Design, planning and execution of mineral extraction, fossil and nuclear fuel extraction, groundwater extraction, geotechnical extraction and fluid injections into underground structures

Get an overview of mineral and energy resources, both referring to its origin as prospecting tools.

STUDY LOAD

Type	Hours	Percentage
Hours medium group	15,0	13.33
Self study	63,0	56.00
Guided activities	4,5	4.00
Hours large group	19,5	17.33
Hours small group	10,5	9.33

Total learning time: 112.5 h

CONTENTS

Introduction and origin of resources

Description:

It will be what a mineral deposit and what are the geological processes that can generate. Also see how ideas have evolved about the genesis and use of resources.

General elements of the various deposits especially abundant iron and alumni.

It will cover a few items of anomalies produced by igneous processes and / or hydrothermal, the latter associated with both magmas and associated sedimentary basins.

Industrial Minerals

5 sessions with samples of hand microscope referidas some types of deposits.

Specific objectives:

Identify and describe paragenesis

Full-or-part-time: 60h

Theory classes: 15h

Laboratory classes: 10h

Self study : 35h



Energy resources

Description:

Convecionals and unconventional fossil fuels
Nuclear and renewables
Stages of an oil exploration

Full-or-part-time: 43h 12m

Theory classes: 12h

Laboratory classes: 6h

Self study : 25h 12m

Seminars and assessments

Full-or-part-time: 4h 48m

Laboratory classes: 2h

Self study : 2h 48m

GRADING SYSTEM

The mark of the course is obtained from the ratings of continuous assessment and their corresponding laboratories and/or classroom computers.

Continuous assessment consist in several activities, both individually and in group, of additive and training characteristics, carried out during the year (both in and out of the classroom).

The teachings of the laboratory grade is the average in such activities.

The evaluation tests consist of a part with questions about concepts associated with the learning objectives of the course with regard to knowledge or understanding, and a part with a set of application exercises.

Criteria for re-evaluation qualification and eligibility: Students that failed the ordinary evaluation and have regularly attended all evaluation tests will have the opportunity of carrying out a re-evaluation test during the period specified in the academic calendar. Students who have already passed the test or were qualified as non-attending will not be admitted to the re-evaluation test. The maximum mark for the re-evaluation exam will be five over ten (5.0). The non-attendance of a student to the re-evaluation test, in the date specified will not grant access to further re-evaluation tests. Students unable to attend any of the continuous assessment tests due to certifiable force majeure will be ensured extraordinary evaluation periods.

These tests must be authorized by the corresponding Head of Studies, at the request of the professor responsible for the course, and will be carried out within the corresponding academic period.

EXAMINATION RULES.

It cannot be approved if a 0 is drawn on one of the parts.

BIBLIOGRAPHY

Basic:

- Craig, J.R.; Vaughan, D.J.; Skinner, B.J. Earth resources and the environment. 4th ed. Upper Saddle River, N.J.: Pearson Prentice Hall, 2011. ISBN 9780321676481.

- Arndt, Nicholas T. ; Fontboté, Lluís; Hedenquist, Jeffrey W... [et al.]. "Future Global Mineral Resources". Geochemical perspectives [on line]. Vol. 6, num. 1, abril 2017 [Consultation: 04/04/2023]. Available on: <https://www.geochemicalperspectives.org/wp-content/uploads/v6n1.pdf>.