



Faculty of Experimental Sciences

GENERAL SPECIFICATIONS

ACADEMIC YEAR 2023-24

DEGREE IN GEOLOGY, DEGREE IN ENVIRONMENTAL SCIENCES,
DOUBLE DEGREE IN ENVIRONMENTAL SCIENCES & GEOLOGY

Subject Data

Name:

GEOLOGÍA Y ECONOMÍA DE LOS RECURSOS MINERALES

English name:

GEOLOGY AND ECONOMY OF MINERAL RESOURCES

Code:

757609301, 757709327, 757914327

Type:

COMPLEMENTARY GEOLOGICAL CONTENTS

Hours:

| | Total | In class | Out class |
|--------------------------|-------|----------|-----------|
| Time distribution | 150 | 60 | 90 |

ECTS:

| Standard group | Small groups | | | |
|----------------|--------------|-----|-----------|--------------------|
| | Classroom | Lab | Practices | Computer classroom |
| 4 | 0 | 0 | 2 | 0 |

Departments:

Ciencias de la Tierra / Earth Sciences

Knowledge areas:

Cristalografía y Mineralogía / Crystallography & Mineralogy

Year:

4º

Semester

Second semester

TEACHING STAFF

Name:

José Miguel Nieto Liñán

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Others Data (Tutoring, schedule...)

See the information in the Web Page of the Faculty of Experimental Sciences

SPECIFIC INFORMATION OF THE COURSE

ANEXO I

1. Contents description:

1.1 In English:

The subject is an introduction to the Geology and Economy of Mineral Resources, in order to reinforce the training already obtained in the applied geology field. It is taught in the fourth year and is based on prior knowledge of the fundamental subjects that constitute the basic knowledge of Geology acquired by the student in previous courses.

1.2 In Spanish:

La asignatura es una introducción a la Geología y Economía de los Recursos Minerales, con el fin de reforzar la formación ya obtenida en el campo de la geología aplicada. Se imparte en cuarto curso y se basa en los conocimientos previos de las materias fundamentales que constituyen los conocimientos básicos de Geología adquiridos por el alumno en cursos anteriores.

2. Background:

2.1 Situation within the Degree:

The subject is an introduction to the Geology and Economy of Mineral Resources, in order to reinforce the training already obtained in the applied geology field. It is taught in the fourth year and is based on prior knowledge of the fundamental subjects that constitute the basic knowledge of Geology acquired by the student in previous courses.

2.2 Recommendations

Previous notions of Mineralogy, Petrology and Geochemistry are desired. The course is recommended for students of Earth & Environmental Sciences. For other students please contact the teaching staff.

3. Objectives (as result of teaching):

By the end of the course students should be able:

- To know and understand the terminology, fundamental concepts and principles of mineral resources classification.
- To analyze and synthesize the main characteristics of the different types of mineral resources and their geological contexts.
- To know the basics of the economy of mineral resources.
- To know the methods of exploitation and processing of mineral resources and to understand the concept of sustainable mining.

4. Skills to be acquired

4.1 Specific Skills:

- E2 - Ability to identify and characterize the properties of different materials and geological processes (minerals, rocks, fossils, reliefs, structures, etc.) using geological, geophysical, geochemical, etc. methods.
- E5 - Know and use theories, paradigms, concepts and principles of Geology
- E9 - Know how to prepare, process, interpret and present data using the appropriate qualitative and quantitative techniques, as well as the appropriate computer programs.
- E13 - Have a general vision of Geology on a global and regional scale.
- E16 - Correctly use the terminology, nomenclature, conventions and units in Geology.
- E17 - Explore and evaluate natural resources.
- E19 - Diagnose and provide solutions to environmental problems related to Earth Sciences.
- E20 - Ability to use geological knowledge in the basic fields of the profession

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4.2 General, Basic or Transversal Skills:

- G1 - Capacity for analysis and synthesis.
- G2 - Autonomous learning capacity.
- G3 - Oral and written communication skills.
- G7 - Capacity for organization and planning.
- G8 - Information management capacity.
- G9 - Ability to apply knowledge to practice.
- G14 - Capacity for critical and self-critical reasoning.

CB1 - That students have demonstrated to possess and understand knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects involving knowledge coming from the forefront of their field of study.

CB2 - That students know how to apply their knowledge to their work or vocation in a professional way and possess the skills to demonstrate through the elaboration and defense of arguments and the resolution of problems within their area of study.

CB3 - That students have the ability to gather and interpret relevant data (normally within their area of study) to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature.

CB4 - That students can transmit information, ideas, problems and solutions to both a specialized and non-specialized public.

CB5 - That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

CT1 - That students have developed and demonstrated learning skills and knowledge from their field of study, being able to apply them in their work, interpreting relevant data to make judgments on topics of various kinds, being able to transmit them to both specialized and non-specialized audiences. specialized.

5. Training Activities and Teaching Methods

5.1 Training Activities:

- Practical theoretical group.
- Fieldwork teaching group.

5.2 Teaching Methods:

- Face-to-face classes related to the theoretical contents of the subject, using teaching resources such as transparencies, computerized presentations and videos.
- Fieldwork practices handling of experimental techniques, discussion of results, drawing conclusions, presentation of a final report.

5.3 Development and Justification:

During the lectures, the professor will explain the theoretical contents of the subject. The students will also have the chance to solve some problems and doubts about theoretical contents under the supervision of the professor. Filed sessions will consist in exercises also supervised by the professor focused on the main aspects of the subject: Mineral Resources. The individual and group tutorials will be aimed to answer and solve any question of the students about the subject.

6. Detailed Contents

INTRODUCTION

Lesson 1. Classification and origin of mineral resources

Lesson 2. Exploitation and processing of mineral resources

METALLIC MINERAL RESOURCES

Lesson 3. Iron, steel and ferrous metals

Lesson 4. Base metals and light metals

Lesson 5. Precious metals and industrial metals

NON-METALLIC MINERAL RESOURCES

Lesson 6 Minerals with gemological interest

Lesson 7. Industrial Minerals

Lesson 8. Cement, aggregates and dimension stones

ENERGY RESOURCES

Lesson 9. Fossil Fuels

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Lesson 10. Radioactive Fuel

ECONOMY OF MINERAL RESOURCES AND SUSTAINABLE MINING

Lesson 11. Economy of mineral resources

Lesson 12. Sustainable mining

FIELDWORK

Four visits to mining areas, active or abandoned. After each field day the student will submit a report on the work done in the field, including a description of the area visited, the mining operations, and/or the land reclamation options.

7. Bibliography

7.1 Basic Bibliography:

- Craig, J.R., Vaughan, D.J. & Skinner, B.J. (2011). Earth Resources and the Environment. 4rd Ed. Prentice Hall, New Jersey, 520 pp.
- Kesler S.E. & Simon A.C. (2015). Mineral Resources, Economics and the Environment 2nd Ed. Cambridge University Press.

7.2 Additional Bibliography:

- Arndt, N. & Ganino C. (2012). Metals and Society: An Introduction to Economic Geology. Springer-Verlag, 160 pp.
- Carr, D.D. y Herz, N. (Eds.) (1989). Concise Encyclopedia of Mineral Resources. Pergamon Press, Oxford.
- O'Hara, K.D. (2014). Earth Resources and Environmental Impacts. John Wiley & Sons Inc., New Jersey, 538 pp.

8. Systems and Assessment Criteria

8.1 System for Assessment:

- Final exam
- Fieldwork reports
- Continuous assessment

8.2 Assessment Criteria and Marks:

8.2.1 Examinations Convocatory I

The evaluation of the subject will be divided into the following three components:

- Theory contents: The grade for this part will constitute 70% of the overall score for the course. It will be evaluated through a final theory exam that will consist of answering a series of questions on the theory contents.
- Fieldwork: The grade for this part will constitute 30% of the overall score for the course. It will be evaluated through a written report on the contents of the work done in the field, together with the continuous evaluation of the work done in the field.

Each part will be evaluated in terms of a numerical scale from 0 to 10. Students are required to obtain a minimum of 4 in each part to make the final average grade. Final results will be given using the final average grade taking into account the percentages, with the corresponding qualitative ratings below: • <=4.9: Fail (D) • 5.0 - 6.9: Pass (C) • 7.0 - 8.9: Pass with Merit (B) • 9.0 - 10: Distinction (A).

8.2.2 Examinations Convocatory II

Continuous evaluation is not applicable.

8.2.3 Examinations Convocatory III

Continuous evaluation is not applicable.

8.2.4 Extraordinary Convocatory

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Continuous evaluation is not applicable.

8.3 Single Final Evaluation:

Those students that have not properly followed the course or those that choose to have a single assessment will have a single final exam. The evaluation will consist on a written test in which 80% of the score will correspond to questions related to the contents of the theory program and the remaining 20% to the contents explained in the field work.

Note: This system is also applicable to ordinary evaluations II and III and to extraordinary evaluation.

ANEXO I

| 9. Indicative weekly teaching organization: | | | | |
|---|--------------|----------------|-----------------------------------|------------------------------|
| Date | Large groups | Small groups | Evaluable tests and/or activities | Content |
| | | Computer class | | |
| 1st | 6 | 0 | | Lesson 1 & 2 |
| 2nd | 6 | 0 | | Lesson 3 |
| 3rd | 6 | 0 | | Lesson 4 |
| 4th | 6 | 10 | | Lesson 5, Fieldwork 1 & 2 |
| 5th | 6 | 5 | | Lesson 6, 7 & 8, Fieldwork 3 |
| 6th | 6 | 5 | | Lesson 9 & 10, Fieldwork 4 |
| 7th | 4 | 0 | | Lesson 11 & 12 |
| 8th | 0 | 0 | | |
| 9th | 0 | 0 | | |
| 10th | 0 | 0 | | |
| 11th | 0 | 0 | | |
| 12th | 0 | 0 | | |
| 13th | 0 | 0 | | |
| 14th | 0 | 0 | | |
| 15th | 0 | 0 | | |
| Total | 40 | 20 | | |