

## 60434 - Economic and applied mineralogy

### Información del Plan Docente

Academic Year	2017/18
Faculty / School	100 - Facultad de Ciencias
Degree	541 - Master's in Geology: Techniques and Applications
ECTS	5.0
Year	1
Semester	Second semester
Subject Type	Optional
Module	---

### **1.General information**

#### **1.1.Introduction**

#### **1.2.Recommendations to take this course**

#### **1.3.Context and importance of this course in the degree**

#### **1.4.Activities and key dates**

### **2.Learning goals**

#### **2.1.Learning goals**

#### **2.2.Importance of learning goals**

### **3.Aims of the course and competences**

#### **3.1.Aims of the course**

#### **3.2.Competences**

### **4.Assessment (1st and 2nd call)**

#### **4.1.Assessment tasks (description of tasks, marking system and assessment criteria)**

### **5.Methodology, learning tasks, syllabus and resources**

#### **5.1.Methodological overview**

Economic and Applied Mineralogy is the science aiming at the study of problems related to the use of mineral resources at the service of mankind, and the impact of human activities on the mineral world. Of particular interest are those problems related to the exploration, exploitation and processing of mineral resources, on one hand, and the problems related to health, mineral waste disposal and geomaterials alteration, on the other hand.

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### 5.2.Learning tasks

The course includes the following learning activities:

- Activity 1 - Lectures to acquire the theoretical knowledge of Economic and Applied Mineralogy (24 hours, attendance required)
- Activity 2 - Problem-solving sessions (8 hours, attendance required)
- Activity 3 - Laboratory sessions (10 hours, attendance required)
- Activity 4 - Field work (8 hours)

### 5.3.Syllabus

The course will address the following topics:

Lectures (Activity 1- Theory lectures to acquire the theoretical knowledge of Economic and Applied Mineralogy. 24 hours, attendance required)

- S1.- Introduction to Environmental Mineralogy. Environmental impacts on mine site. Mining and Remediation. Atmosphere, hydrosphere and soils
- S2.- Acid mine drainage (AMD) and related mineral phases: the Iberian Pyrite Belt example. Suitability minerals for controlled landfill and waste mines
- S3.- Industrial minerals and his applications
- S4.- Human health impacts of minerals
- S5.- Biominerals
- S6.- Crystalline synthesis

Practice sessions (Activity 2 - Problem-solving sessions. 8 hours, attendance required)

- P1.- Identification of mineral phases related to AMD (DRX) and AMD assessment

Laboratory sessions (Activity 3 - Laboratory practices. 10 hours, attendance required)

- P1.- Identification of industrial minerals
- P2.- Synthesis of crystals in laboratory

Field work sessions (Activity 4 - Field work. 8 hours)

### 5.4.Course planning and calendar

The course will consist of 6 lectures of 4 hours each, which will be held at Lab 18, Crystallography and Mineralogy Unit, Building C of the Science Faculty, on Tuesday from 9.00 to 13.00.

Practice sessions (three 4-hour sessions) will be held on Tuesday from 9.00 to 13.00 at Lab 18, Crystallography and Mineralogy Unit, and classroom 3.

All lab reports must be handed in at the end of the lab session.

### 5.5.Bibliography and recommended resources

- Carretero León, María Isabel. Mineralogía aplicada : salud y medio ambiente / María Isabel Carretero León, Manuel Pozo Rodríguez Madrid [etc.] : Thomson-Paraninfo, D.L. 2007

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- Chang, L. L. Y.. Industrial mineralogy : materials, processes and uses / Luke L. Y. Chang, Bs., Ph. D. New Jersey : Prentice Hall , cop. 2002.
- Mineralogía aplicada / editor, Emilio Galán Huertos ; Manuel Regueiro González-Barros... [et al.] Madrid : Síntesis, D.L. 2003
- Jambor, J.L.. Environmental aspects of mines wastes. Mineralogical Association of Canada. 2003
- Vaughan, D.J. Environmental Mineralogy. The Mineralogical Society UK. 2000
- Industrial minerals and rocks : commodities, markets, and users / edited by Jessica Elzea Kogel... [et al.] . - 7th ed. New York : Society for Mining, Metallurgy, and Exploration, cop. 2006
- Manning, D.A.C.. Introduction to industrial minerals / D.A.C. Manning. . - 1st ed. London [etc.] : Chapman & Hall, 1995.