

### COURSE NAME

Name: **ENERGETIC RESOURCES: CHARACTERIZATION**

Code: 101210

Curriculum: **DEGREE IN ENERGY ENGINEERING AND MINERAL RESOURCES**

Year: 3

Name of the module to which it belongs: SPECIFIC TO ENERGY RESOURCES, FUELS AND EXPLOSIVES

Subject: PROCESS AND ENERGY ENGINEERING

Nature: OBRIGATORY Duration: SECOND SEMESTER

ECTS Credits: 6

Classroom hours: 60

Face-to-face classroom percentage: 40%

Non-contact hours: 90

### FACULTY DETAILS

Name: GÓMEZ CÁMER, JUAN LUIS (Coordinador)

Department: INORGANIC CHEMISTRY AND CHEMICAL ENGINEERING

Area: INORGANIC CHEMISTRY

Location of the office: Inorganic Chemistry Laboratory Office

E-Mail: jl.gomez@uco.es

Phone number: 957218620

Name: BENÍTEZ DE LA TORRE, ALMUDENA

Department: INORGANIC CHEMISTRY AND CHEMICAL ENGINEERING

Area: INORGANIC CHEMISTRY

Location of the office: Inorganic Chemistry Laboratory Office

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Phone number: 957218620

### SKILLS

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|--------|---|
| CB1    | Have and understand specific knowledge of the field of study of mining engineering.   |
| CB2    | Have and understand current and cutting-edge knowledge of the field of mining engineering.  |
| CB3    | Be able to apply the knowledge acquired in professional contexts and to elaborate and defend arguments in the field of knowledge of mining engineering. |
| CU2    | Know and refine the user level of ITs.  |
| CERE1A | Ability to know, understand and use the principles of use of energy resources.  |
| CERE4  | Basic operations of processes.  |
| CERE5  | Refining, petrochemical and carbochemical processes.  |

### OBJECTIVES

To provide students with basic knowledge of the physical and chemical properties of energy resources, analysing and characterising the main fuel compounds such as coal, oil, natural gas and biofuels.

### CONTENTS:

#### 1. Theoretical contents

- Topic 1. Current energy sources.
- Topic 2. Fossil fuels.
- Topic 3. Coal: fossil resource.
- Topic 4. Coal: properties as a fuel.
- Topic 5. Liquid and gas fuels

Topic 6. Oil. Petroleum origins and geology.

Topic 7. Natural gas.

Topic 8. Biofuels.

### 2. Practical contents.

Each topic is accompanied by a collection of exercises and problems on the theoretical content, the discussion and solving of these being the basis of the activities included in the seminar section. In addition, there will be a series of specific practical seminars dedicated to the following issues.

- Seminars on the use of energy resources: World energy economy. Energy balance by country. Energy assessment rates. Analysis of the evolution of energy consumption.

- Seminars on burning fossil resources:

Reactions and calculations of complete combustion. Reactions and calculations of incomplete combustion. Calculations with combustion diagrams: Bunte, Ostwald and Keller.

- Seminars on characterising fossil fuels: Analysis of combustion gases. Elemental analysis of coals. Analysis of the calorific value of fuels.