

COURSE NAME

Name: **MATERIALS TECHNOLOGY**

Code: 101193

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

Year: 2

Name of the module to which it belongs: COMMON MODULE FOR THE MINING BRANCH

Subject: MATERIALS SCIENCE AND TECHNOLOGY

Nature: OBRIGATORY Duration: SECOND SEMESTER

ECTS Credits: 6

Classroom hours: 60

Face-to-face classroom percentage: 40%

Non-contact hours: 90

FACULTY DETAILS

Name: BARBUDO MUÑOZ, MARÍA AUXILIADORA (Coordinator)

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Name: BRAVO MÁRQUEZ, MANUEL JOSÉ

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Name: LOPEZ MUÑOZ, ANTONIO CLEOFÉ

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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. |
| CEC5 | Ability to know, understand and use the principles and technologies of materials.. |

OBJECTIVES

- Learn the physical, mechanical and technological properties of the main construction materials used in engineering works.
 - Learn the standardized tests that must be applied in each case, and interpret the results.
 - Obtain a basic overview of a laboratory analysis of construction materials.
 - Concrete dosing.
- SDG:
- Ensure inclusive and equitable quality education and promote life-long learning opportunities for all. Ensure sustainable consumption and production methods
 - Build resilient infrastructures, promote sustainable and inclusive industrialization and foster innovation
 - Ensure access to affordable, reliable, sustainable, and modern energy for everyone

CONTENTS:

1. Theoretical contents

Topic 1. Technological properties of materials.

Topic 2. Stone materials

2.1 Rocks.

2.2 Aggregates.

2.3 Soils.

2.4 Properties of stone materials.

Topic 3. Metallic materials

Topic 4. Binding materials

4.1 Bituminous materials.

4.2 Plasters.

4.3 Limes.

4.4 Cement.

Topic 5. Geosynthetics, ceramics and other materials

5.1 Synthetic materials.

5.2 Ceramic materials.

5.3 New materials used in construction.

Topic 6. Concrete

6.1 Ready-mixed concrete.

6.2 Hardened concrete.

Topic 7. Concrete dosage

2. Practical contents.

- Quartering of aggregates
- Aggregate granulometry
- Density and absorption of aggregates. Pycnometer method
- Los Angeles test
- Modified Proctor test
- CBR
- Marshall test on bituminous mat.
- Identification and breaking of steel bars
- Manufacture and consistency of concrete
- Tests on hardened concrete