

### COURSE NAME

Name: **SOIL AND ROCK MECHANICS**

Code: 101134

Curriculum: **DEGREE IN CIVIL ENGINEERING**

Year: 2

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

Subject: SOIL AND ROCK MECHANICS

Nature: OBRIGATORY Duration: SECOND SEMESTER

ECTS Credits: 6

Classroom hours: 60

Face-to-face classroom percentage: 40%

Non-contact hours: 90

### FACULTY DETAILS

Name: DAZA SÁNCHEZ, ANTONIO SERAFIN (Coordinator)

Department: MECHANICS

Area: GROUND ENGINEERING

Location of the office: GROUND ENGINEERING LABORATORY

E-Mail: me1dasaa@uco.es

Phone number: 957213061

Name: GUTIÉRREZ-RAVÉ CABALLERO, JESÚS

Department: MECHANICS

Area: GROUND ENGINEERING

Location of the office: GROUND ENGINEERING LABORATORY

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Phone number: 957213062

### SKILLS

- CB1 Have and understand specific knowledge of the study area of the Degree that gives skills for the exercise of the profession of Technical Civil Engineering.
- CB2 Have and understand updated and cutting-edge knowledge related to the field of study of the degree of Technical Civil Engineering.
- CB3 Be able to apply the knowledge acquired to their work or vocation in a professional manner. Prepare and defend arguments in the relevant knowledge area.
- CB4 Solve problems within the study area of Civil Engineering.
- CU2 Know and refine the user level of ITs.
- CEC5 Knowledge of geotechnics and mechanics of soils and rocks, as well as their application to the development of studies, projects, constructions and operations that require earthworks, foundations and containment structures.

### OBJECTIVES

Learning outcome nº 1: Knowledge of soil behavior and its interaction with engineering works.

Learning outcome nº 2: Knowledge of the behavior of rocky massifs and their interaction with engineering works

### CONTENTS:

#### 1. Theoretical contents

Block I: Soil Mechanics

Topic-1. Introduction. Constitution and physical properties of soils.

Topic-2. Identification of soil structures. Soil classification.

Topic-3. Compaction. Ground bearing capacity.

Topic-4. Permeability, filtration and flow networks.

Topic-5. Failure criteria: shear resistance of soils. Theory of consolidation. The elastic solid.

### Block II: Rock Mechanics

Topic-6. Physical and mechanical properties of rocky materials.

Topic-7. Stresses and strains in rocks.

Topic-8. Description of rocky massifs.

### Block III: Applications

Topic-9 Planning of geotechnical campaigns.

Topic-10. Shallow foundations. Deep foundations.

Topic-11. Stability analysis of slopes and containment structures.

Directed Academic Activity Block: COMPUTATIONAL GEOTECHNICS SEMINAR

## 2. Practical contents.

Sampling procedure. Granulometric test. Dynamic penetration.

Atterberg limits. Static penetration.

Proctor compaction test.

CBR bearing capacity test. Plate load test.

CBR test-discussion. Swelling-settlement analysis.

Direct shear test in soils and rocks.

Oedometer consolidation test.

Point load, sclerometer and Brazilian tests. Use of the compass.

Continuous sample drilling and geotechnical core logging.

Obtaining the RMR index. Application to tunnel support and slope