

## SUBJECT TEACHING GUIDE

### G1979 - Soil and Rock mechanics

#### Degree in Civil Engineering First Degree in Civil Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Civil Engineering First Degree in Civil Engineering			Type and Year	Compulsory. Year 3 Compulsory. Year 3
Faculty	School of civil Engineering				
Discipline	FUNDAMENTALS OF SOIL ENGINEERING				
Course unit title and code	G1979 - Soil and Rock mechanics				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. CIENCIA E INGENIERIA DEL TERRENO Y DE LOS MATERIALES				
Name of lecturer	ALMUDENA DA COSTA GARCIA				
E-mail	almudena.dacosta@unican.es				
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 1. BECARIOS - GEOTECNIA (1055)				
Other lecturers	JORGE CASTRO GONZALEZ				

### 3.1 LEARNING OUTCOMES

- Soil description and classification.
- Calculation of pore pressure in soils. Seepage through soils. Quick condition
- Calculation of total and effective stresses. The principle of effective stress
- Calculation of settlements in confined compression situations
- Estimation of strength parameters of soils from laboratory tests.
- Analysis of tests to study soil strength and deformation

#### 4. OBJECTIVES

Knowledge and identification of the different types of soils and how they behave in different processes .  
 Understand the models to predict soil behavior.  
 Ability to define the processes needed to obtain soil parameters and critically evaluate the results.  
 Identify the geotechnical processes involved in typical real cases.  
 Choose in each case the theoretical model to be applied and the most appropriate calculation methods according to the range of possible structural solutions.  
 The student must understand that theoretical calculations, even when they are very refined, are only numerical modelling of the phenomenon.  
 Understand the generalities of the phenomenon under study by analyzing a specific case.

#### 6. SUBJECT PROGRAM

CONTENTS	
1	Soils and rocks: origin, identification and classification
2	Ground water: at rest and steady flow
3	Stresses in soils
4	Soil behaviour under confined compression. Oedometric test
5	Partially saturated soils
6	Strength and deformation of soils
7	Rock mechanics

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Exam units 1 and 2	Written exam	No	Yes	40,00
Exam units 3, 4 and 5	Written exam	Yes	Yes	50,00
	Laboratory evaluation	No	No	10,00
TOTAL				100,00
Observations				
Observations for part-time students				
Students undertaking the course in part time modality could be evaluated in the same way as the standard modality or they can undertake a final exam for whole subject				

#### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Geotecnia I: Propiedades del terreno. C. Sagaseta, J. Cañizal y A. da Costa. E.T.S. de Ingenieros de Caminos, C. y P. Santander, 2007.

Geotecnia y Cimientos I. Propiedades de los suelos y de las rocas. J.A. Jiménez Salas, y J.L. de Justo Alpañés. Editorial Rueda, 1975.

Geotecnia y Cimientos II. Mecánica del suelos y de las rocas. J.A. Jiménez Salas, J.L. de Justo Alpañés y A.A. Serrano. Editorial Rueda, 1976.

