

SUBJECT TEACHING GUIDE

1120 - Geotechnics and Foundation calculations

Master's Degree in mining engineering

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Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Master's Degree in mining engineering Master's Degree in mining engineering			Type and Year	Compulsory. Year 1 Compulsory. Year 1
Faculty	School of Mines and Energy Engineering				
Discipline	SCIENTIFIC EXPANSION				
Course unit title and code	1120 - Geotechnics and Foundation calculations				
Number of ECTS credits allocated	3	Term	Semester based (1)		
Knowledge Field	Architecture, construction, building and urban planning, civil engineering Architecture, construction, building and urban planning, civil engineering				
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. CIENCIA E INGENIERIA DEL TERRENO Y DE LOS MATERIALES
Name of lecturer	JORGE CASTRO GONZALEZ
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Other lecturers	MARINA MIRANDA MANZANARES

4. OBJECTIVES

- To understand the different ground survey techniques, the ground parameters that can be obtained and to be able to define the best techniques for each specific case.
- To understand the geotechnical process in real projects, identifying the applicable regulations and selecting the most appropriate methods of analysis.
- To know the different types and construction techniques of shallow and deep foundations.
- Dimensioning and calculation of shallow and deep foundations.
- To be able to calculate earth pressures on retaining structures.
- To know the different methods of excavation support.
- To calculate the stability of earth retaining walls.

6. SUBJECT PROGRAM

CONTENTS

1	Geotechnical investigation and characterisation: test pits and boreholes, sampling, laboratory and field tests, determination of soil parameters.
2	General methods of geotechnical analysis: limit states, safety coefficients, standards.
3	Shallow foundations: typology, bearing capacity and settlement calculations, design using field tests.
4	Deep foundations: typology, bearing capacity (tip and shaft resistance), group effects, negative skin friction.
5	Earth retaining walls: typology, construction methods, earth pressure calculation, analysis of wall stability.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Project assessment: Project on foundations.	Work	No	Yes	30,00
Practical assessment: Continuous assessment activities	Others	No	No	10,00
Written assessment: Final exam	Written exam	Yes	Yes	60,00
TOTAL				100,00
Observations				
If the grade obtained in the Foundation Project or in the Final Exam is lower than the minimum required, the total grade will be equal to the sum of the marks obtained in the various assessment methods, with a maximum total grade of 4.9, as set out in the University of Cantabria Assessment Regulations.				
Observations for part-time students				
Part-time students will be assessed by means of a final written exam, which will cover the entire module/course and will be held within the period specified by the university. Students may resit the assessment within the specified period.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

- Geotecnia y Cimientos II. Mecánica del suelo y de las rocas. 1976. Jiménez Salas y otros. Ed. Rueda.
- Geotecnia y Cimientos III. Cimentaciones, excavaciones y aplicaciones de la Geotecnia. 1980. Jiménez Salas y otros. Ed. Rueda.
- Eurocódigo EC7 (UNE-EN 1997).
- Código Técnico de la Edificación. 2006. Ministerio de Vivienda.
- Guía para el proyecto de cimentaciones en obras de carretera con Eurocódigo 7: Bases del proyecto geotécnico. 2022. Ministerio de Transportes, Movilidad y Agenda Urbana.
- Guía para el proyecto de cimentaciones en obras de carretera con Eurocódigo 7: Ejemplos de aplicación de cimentaciones superficiales. 2022. Ministerio de Transportes, Movilidad y Agenda Urbana.
- Guía de Cimentaciones en Obras de Carreteras. 2003. Ministerio de Fomento.