Course guide
2500056 - GECCONGEOT - Geotechnical Constructions

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.
Degree: BACHELOR'S DEGREE IN CIVIL ENGINEERING (Syllabus 2020). (Optional subject).
Academic year: 2022 ECTS Credits: 4.5 Languages: Catalan

LECTURER
Coordinating lecturer: SEBASTIAN OLIVELLA PASTALLE
Others: SEBASTIAN OLIVELLA PASTALLE, NURIA MERCE PINYOL PUIGMARTI, IVAN PUIG DAMIANS

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Generical:
14380. Scientific-technical training for the exercise of the profession of Technical Engineer of Public Works and knowledge of the functions of advice, analysis, design, calculation, project, construction, maintenance, conservation and exploitation.
14383. Ability to project, inspect and direct works, in their field.
14386. Capacity for maintenance, conservation and exploitation of infrastructure, in its field.
14389. Knowledge of the history of civil engineering and training to analyze and assess public works in particular and construction in general.
14391. Conceive, project, manage and maintain systems in the field of construction engineering. Cover the entire life cycle of an infrastructure or system or service in the field of construction engineering. (Additional school competition).

TEACHING METHODOLOGY

The course consists of 1.5 hours per week of classroom activity (large size group) and 1.5 hours weekly with half the students (medium size group).

The 1.5 hours in the large size groups are devoted to theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises.

The 1.5 hours in the medium size groups is devoted to solving practical problems with greater interaction with the students. The objective of these practical exercises is to consolidate the general and specific learning objectives.

Support material in the form of a detailed teaching plan is provided using the virtual campus ATENEA: content, program of learning and assessment activities conducted and literature.
LEARNING OBJECTIVES OF THE SUBJECT


1. Ability to design and analyze land outlets. 2) Capaticat to analyze problems of slope stability in linear works. 3) Ability to apply concepts on soil improvement.

- Behavior of dams, embankments and, in general, geotechnical structures that involve construction with the soil. Auxiliary Systems in Geotechnical Engineering for waterproofing and / or soil improvement. Geomembranes and Geotextiles. - Design of waterproofing systems for the protection of the environment. Design, specifications and construction of filters and other auxiliary elements.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Guided activities</td>
<td>4,5</td>
<td>4,00</td>
</tr>
<tr>
<td>Self study</td>
<td>63,0</td>
<td>56,00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>22,5</td>
<td>20,00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>22,5</td>
<td>20,00</td>
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Total learning time: 112.5 h

CONTENTS

1. Introduction

Description:
Subject presentation

Full-or-part-time: 2h 24m
Theory classes: 1h
Self study : 1h 24m

2. Geotechnics in hydraulic infrastructures

Description:
Embankments to build channels and aqueducts.
Methodology discussion
Landings. Behavior during construction and operation
Methodology discussion
Urban underground conduits and canalizations
Methodology discussion
Singular underground aqueduct
Settlements in big infrastructures
Methodology discussion

Full-or-part-time: 33h 36m
Theory classes: 10h
Practical classes: 4h
Self study : 19h 36m
### 3. Tools for analysis

**Description:**
Programs for calculating foundations and walls  
Practical aspects

**Full-or-part-time:** 9h 36m  
Theory classes: 2h  
Practical classes: 2h  
Self study: 5h 36m

### 4. Geotechnics in transportation infrastructures

**Description:**
Foundations for especial structures on roads  
Methodology discussion  
Reinforcement of slopes in railway works  
Methodology discussion  
Infiltration ponds, interaction with transportation infrastructures  
Methodology discussion  
Reinforced soil walls  
Methodology discussion

**Full-or-part-time:** 28h 47m  
Theory classes: 8h  
Practical classes: 4h  
Self study: 16h 47m

### 5. Geotechnics in other infrastructures

**Description:**
Engineering barriers for waste isolation  
Methodology discussion

**Full-or-part-time:** 9h 36m  
Theory classes: 2h  
Practical classes: 2h  
Self study: 5h 36m

### 6. Evaluation

**Description:**
Coursework, presentation in class  
Course assignment, development

**Full-or-part-time:** 24h  
Practical classes: 4h  
Laboratory classes: 6h  
Self study: 14h
**GRADING SYSTEM**

The mark of the course is obtained from the ratings of continuous assessment and their corresponding laboratories and/or classroom computers.

Continuous assessment consist in several activities, both individually and in group, of additive and training characteristics, carried out during the year (both in and out of the classroom).

The teachings of the laboratory grade is the average in such activities.

The evaluation tests consist of a part with questions about concepts associated with the learning objectives of the course with regard to knowledge or understanding, and a part with a set of application exercises.

**BIBLIOGRAPHY**

**Basic:**