220239 - Geotechnical Engineering

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 758 - EPC - Department of Project and Construction Engineering
Academic year: 2018
Degree: MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING (Syllabus 2016). (Teaching unit Optional)
MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Optional)
MASTER'S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
ECTS credits: 3
Teaching languages: English

Teaching staff
Coordinator: David Vives

Teaching methodology
The course is divided into parts:
Theory classes
Practical classes
Self-study for doing exercises and activities.
In the theory classes, teachers will introduce the theoretical basis of the concepts, methods and results and illustrate them with examples appropriate to facilitate their understanding.
In the practical classes (in the classroom), teachers guide students in applying theoretical concepts to solve problems, always using critical reasoning. We propose that students solve exercises in and outside the classroom, to promote contact and use the basic tools needed to solve problems.
Students, independently, need to work on the materials provided by teachers and the outcomes of the sessions of exercises/problems, in order to fix and assimilate the concepts.
The teachers provide the syllabus and monitoring of activities (by ATENEA).

Learning objectives of the subject
To achieve a general overview of soil mechanics, earth retaining walls and foundations, allowing the student to face the main basic issues to be developed in a foundation project.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Hours large group:</th>
<th>27h</th>
<th>36.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Hours small group:</td>
<td>0h</td>
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<td></td>
<td>Guided activities:</td>
<td>0h</td>
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<td>Self study:</td>
<td>48h</td>
<td>64.00%</td>
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## Content

### Module 1: SOIL MECHANICS

**Learning time:** 23h  
- Theory classes: 9h  
- Self study: 14h

**Description:**  
- Introduction to soil behavior. Main parameters.  
- Load distribution throughout a soil.  
- Soil's resistance to shear stress.  
- Earth pressure against structures.

### Module 2: EARTH RETAINING STRUCTURES

**Learning time:** 33h  
- Theory classes: 11h  
- Self study: 22h

**Description:**  
- General aspects of earth retaining walls  
- Gravity retaining walls  
- Cantilever earth retaining walls  
- Diaphragm earth retaining walls: BLUM method

### Module 3: FOUNDATIONS

**Learning time:** 19h  
- Theory classes: 7h  
- Self study: 12h

**Description:**  
- Introduction to foundations. Requirements and types.  
- Surface foundations.  
- Pile foundations.

## Qualification system

- 40% Theoretical part exam (1 final exam)  
- 50% Practical part exam (1 final exam)  
- 10% Activities and problems to be proposed in class (during the course)
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Bibliography

Basic:


Complementary: