Course guides  
220022 - TE - Structural Theory

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
Teaching unit: 737 - RMEE - Department of Strength of Materials and Structural Engineering.  

Degree:  
BACHELOR’S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).  
BACHELOR’S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Compulsory subject).  

Academic year: 2021  
ECTS Credits: 7.5  
Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Rafael Weyler Pérez  
Others: Fruitos Bickham, Oscar Alejandro  
Alegre Carrasquer, Daniel  
Martínez Piñol, José Ramón

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:  
1. GrETA/GrEVA - An understanding of the behaviour of structures under stress in ordinary and extreme conditions.  
2. GrETA/GrEVA - An adequate understanding of the following, as applied to engineering: principles of continuum mechanics and techniques for calculating response.

TEACHING METHODOLOGY

It is divided into three parts:  
⋅ Theory lessons where the basic concepts are developed. They took place in the classroom and it is used the expositive method.  
⋅ Exercises lessons, where the theoretical concepts are applied to the resolution of practical examples. It takes place in the classroom, in smaller groups than the ones of theory lessons.  
⋅ Laboratory practices, where, in reduced groups and in a guided way, the students get in contact with the experimental methodology. At the same time, it will be proposed the realization of problems and exercises, as well as the elaboration of a laboratory report that has to be made out of the class hours.

LEARNING OBJECTIVES OF THE SUBJECT

Get the student to understand the behaviour of the structures and resistant structures and to be able of design a structure that is capable of support the efforts that the structures are brought under in good conditions, facing breaking and with deformations compatible with their functionality.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>112.5</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>47.0</td>
<td>25.07</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>21.0</td>
<td>11.20</td>
</tr>
<tr>
<td>Hours small group</td>
<td>7.0</td>
<td>3.73</td>
</tr>
</tbody>
</table>

Total learning time: 187.5 h
## CONTENTS

1. **Elasticity fundaments.**
   - **Description:**
   - **Full-or-part-time:** 65h 30m  
     - Theory classes: 15h  
     - Practical classes: 7h 30m  
     - Laboratory classes: 3h  
     - Self study: 40h

2. **Prismatic part: Study of the straight section.**
   - **Description:**
   - **Full-or-part-time:** 65h 30m  
     - Theory classes: 15h  
     - Practical classes: 7h 30m  
     - Laboratory classes: 3h  
     - Self study: 40h

3. **Prismatic part: behaviour.**
   - **Description:**
   - **Full-or-part-time:** 31h  
     - Theory classes: 7h  
     - Practical classes: 6h  
     - Laboratory classes: 2h  
     - Self study: 16h

4. **Structure calculus**
   - **Description:**
   - **Full-or-part-time:** 25h 30m  
     - Theory classes: 8h  
     - Practical classes: 1h 30m  
     - Self study: 16h

## ACTIVITIES

### THEORY SESSIONS

- **Full-or-part-time:** 77h  
  - Theory classes: 42h  
  - Self study: 35h
**PROBLEM SESSIONS**

Full-or-part-time: 71h  
Practical classes: 21h  
Self study: 50h

**LABORATORY SESSIONS**

Full-or-part-time: 19h 30m  
Laboratory classes: 7h  
Self study: 12h 30m

**ACTIVITY**

Full-or-part-time: 15h  
Self study: 15h

**EXAMS**

Full-or-part-time: 5h  
Theory classes: 5h

**GRADING SYSTEM**

Laboratory practices: 10%  
Partial exam: 30%  
Final exam: 50%  
Proposed activity 10%  
It will be a method to recover unsatisfactory results in the partial exam.

**EXAMINATION RULES.**

The laboratory practices along with the laboratory reports are mandatory to pass the subject.

**BIBLIOGRAPHY**

**Basic:**

**Complementary:**