Course guide
340054 - RMA1-M4O37 - Strength of Materials I

Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 737 - RMEE - Department of Strength of Materials and Structural Engineering.

Degree: BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).
        BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
        BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2022 ECTS Credits: 6.0 Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Musté Rodríguez, Marta

Others: Musté Rodríguez, Marta

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
2. CE14. Knowledge and application of basics of material resistance.
3. CE22. Knowledge and ability to apply basics of elasticity and resistance of materials into behavior of real solids.
4. CE23. Knowledge and ability to calculate and design structures and industrial constructions.

Transversal:
1. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
5. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

TEACHING METHODOLOGY

The directed learning hours consist, on the one hand, of theoretical classes in which the teacher gives a presentation of the concepts of the subject to be learnt. Subsequently, and through practical exercises, they try to motivate and involve the students so that they actively participate in their learning. Support material is used: publications and solved problems. Laboratory practicals are carried out in pairs and allow the development of basic instrumental skills as well as introducing students to electrical extensometry. After each theoretical session, tasks outside the classroom are proposed, to be worked on individually or in groups. It is also necessary to consider other hours of autonomous learning, such as those dedicated to reading oriented readings and the resolution of the proposed problems.

LEARNING OBJECTIVES OF THE SUBJECT

The objective of the subject Resistance of Materials I is to provide the basic conceptual and theoretical training to be able to tackle the design, analysis and co-testing of simple resistant elements. It will be the basis for the study of more complex elements and structures.

The course includes the study of bending in prismatic beams of uniform section, providing the fundamental theoretical basis for the study of their strength and stiffness aspects.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>45,0</td>
<td>30.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

(ENG) Vector Tensió i Estat Tensional Pla

- **Full-or-part-time:** 20h
- Theory classes: 6h
- Laboratory classes: 2h
- Self study: 12h

(ENG) Estat de Tensions Tridimensional

- **Full-or-part-time:** 12h
- Theory classes: 4h
- Self study: 8h

(ENG) Estat de Deformacions en el Sòlid Elàstic

- **Full-or-part-time:** 14h
- Theory classes: 8h
- Theory classes: 4h
- Laboratory classes: 2h

(ENG) Relacions entre Tensions i Deformacions

- **Full-or-part-time:** 18h
- Theory classes: 6h
- Self study: 12h

(ENG) Anàlisi i Disseny de Bigues sotmeses a Flexió

- **Full-or-part-time:** 42h
- Theory classes: 14h
- Laboratory classes: 2h
- Self study: 26h
(ENG) Càlcul de deformacions en Bigues Prismàtiques: Teoremes Energètics

Full-or-part-time: 44h
Theory classes: 14h
Laboratory classes: 2h
Self study: 28h

GRADING SYSTEM

Qualifications:
C1 = Partial control
C2 = Final control

The evaluable content of this part will be the entire subject of the four-month period. Only those students who can justify their absence for serious reasons on the day set for the test will be retaken individually. In the control will only be able to consult, in the part of problems, a form in a DIN A4 sheet on both sides that the student will be able to fill in with the information that he/she considers useful and in which his/her name will have to appear obligatorily. The inclusion of solved problems on this form is strictly forbidden. The form must be handed in at the end of the test. Failure to hand in the form or the inclusion of solved problems in it will automatically result in a qualification of 0 (zero) in the problem section. If a student wishes to take the test without a form, he/she must inform the teacher at the beginning of the test and will be exempted from handing it in. Under no circumstances will the form handed in be returned.

CP = Practicals to be carried out during the course. The composition of the groups and the timetable will be communicated sufficiently in advance.

The final qualification of the course, after the two previous tests, will be the highest value calculated with the following expressions:
Final Qualification = 0.35 - C1 + 0.55 - C2 + 0.1 - CP.
Final qualification = 0.9 - C2 + 0.1 - CP

In case the final qualification, after taking the tests C1 and C2, is equal or higher than 2 and lower than 5, the student will have the possibility of taking a re-evaluation exam, CR with all the material given throughout the four-month period. In this case the qualification of the student, after the re-evaluation, will be given by the following formula:
Final qualification = 0.9 - CR + 0.1 - CP.

This final qualification will indicate whether the re-evaluated student passes or fails the course. However, as the school regulations state, a student who has passed by re-evaluation will have a maximum final grade of 7 in the grade report. For those students who, despite being re-evaluated, do not pass the subject, the final grade that will appear in the grade report will be the higher of the two final grades obtained.

EXAMINATION RULES.

Electronic devices, such as mobile phones, may not be taken to the tests. In the course of the tests, the documentation previously established in class by the teacher and prepared by the student himself/herself in individual handwritten form may be consulted.

BIBLIOGRAPHY

Basic:

Complementary: