Course guide

220235 - 220235 - Theory of Machines

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 712 - EM - Department of Mechanical Engineering.
Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Optional subject).
Academic year: 2022  ECTS Credits: 3.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Francisco Javier Freire Venegas
Others: Marañón Martínez, Ana
Díaz Gonzalez, Carlos Gustavo

REQUIREMENTS

IMPORTANT: These courses are complements to the compulsory training received in the degree by non-GrETI students. Therefore, students from GrETI have already taken them in their curriculum and will not be able to take them as general electives.

TEACHING METHODOLOGY

The teaching methodology is divided into two parts:
- Face-to-face sessions - participation of contents and completion of exercises.
- Laboratori session.
- Self study work and exercises and activities.
In the sessions of exhibition -participation of the contents, the teaching staff will introduce the theoretical bases of the subject, concepts, methods and results illustrating them with convenient examples and requesting, where appropriate, the accomplishment of exercises to facilitate- and their understanding.
The student, independently, must work the material provided by the teaching staff and the result of the work sessions-problems in order to assimilate and set the concepts. The teaching staff will provide a plan for study and follow-up activities (ATENEA).

LEARNING OBJECTIVES OF THE SUBJECT

When finishing the subject the students must know in the concepts, principles and basic fundamentals of kinematics and the dynamics of the multi-body mechanical systems.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>48,0</td>
<td>64.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>27,0</td>
<td>36.00</td>
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Total learning time: 75 h
## CONTENTS

### Module 1: Mechanisms-Degrees of freedom

**Description:**
How to determine the degrees of freedom of the mechanisms.

**Related activities:**
1, 2, 3

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

### Module 2: Kinematics

**Description:**
Calculation of speeds and accelerations

**Related activities:**
1, 2, 3

**Full-or-part-time:** 32h
- Theory classes: 12h
- Self study: 20h

### Module 3: Transmissions-Epicyloid Trains

**Description:**
Study of mechanical transmissions

**Related activities:**
1, 2, 3

**Full-or-part-time:** 25h
- Theory classes: 9h
- Self study: 16h

## ACTIVITIES

### Activity 1: Large group sessions

**Full-or-part-time:** 43h
- Theory classes: 19h
- Self study: 24h
Activity 2: Laboratory

Description:
Normally a practice will be done in the Laboratory. This session can be replaced by an alternative practical activity if necessary.

Full-or-part-time: 8h
Theory classes: 2h
Self study: 6h

Activity 3: Controls in class

Full-or-part-time: 12h
Theory classes: 3h
Self study: 9h

Activity 4: Final exam

Full-or-part-time: 12h
Theory classes: 3h
Self study: 9h

GRADING SYSTEM

- 15% Laboratory
- 15% Control in class 1
- 15% Control in class 2
- 15% Control in class 3
- 40% Final exam at the end of the course

Redirection of unsatisfactory grades in the final exam:
- It will be done by means of a written test on the day reserved by the School for the final exam.
- Students whose final grade is 2.0 or higher have the right to apply.
- The new final mark will be calculated by replacing the final exam grade with the re-conducting test grade, if and only if the latter exceeds the previous grade.

BIBLIOGRAPHY

Basic:

RESOURCES

Other resources: