

220235 - Theory of Machines

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
 Teaching unit: 712 - EM - Department of Mechanical Engineering
 Academic year: 2019
 Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Optional)
 ECTS credits: 3 Teaching languages: Catalan, Spanish

Teaching staff

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

Teaching methodology

The teaching methodology is divided into two parts:

- Face-to-face sessions - participation of contents and completion of exercises.
- 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

Total learning time: 75h	Hours large group:	27h	36.00%
	Self study:	48h	64.00%

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Content

<p>Module 1: Mechanisms-Degrees of freedom</p>	<p>Learning time: 18h Theory classes: 6h Self study : 12h</p>
<p>Description: How to determine the degrees of freedom of the mechanisms. Related activities: 1,2,3</p>	
<p>Module 2: Kinematics</p>	<p>Learning time: 31h Theory classes: 20h Self study : 11h</p>
<p>Description: Calculation of speeds and accelerations Related activities: 1,2,3</p>	
<p>Module 3: Transmissions-Epicyloid Trains</p>	<p>Learning time: 26h Theory classes: 10h Self study : 16h</p>
<p>Description: Study of mechanical transmissions Related activities: 1,2,3</p>	

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Planning of activities

Activity 1: Large group sessions	Hours: 43h Theory classes: 19h Self study: 24h
Activity 2: Laboratory	Hours: 8h Theory classes: 2h Self study: 6h
Activity 3: Controls in class	Hours: 12h Theory classes: 3h Self study: 9h
Activity 4: Final exam	Hours: 12h Theory classes: 3h Self study: 9h

Qualification system

- 25% Laboratory
- 25% 3 Controls in class
- 50% Final exam at the end of the course

Bibliography

Basic:

Paul, Burton. Kinematics and dynamics of planar machinery. Englewood Cliffs, NJ: Prentice Hall Int, cop. 1979. ISBN 9780135160626.

Norton, Robert L. Diseño de maquinaria : síntesis y análisis de máquinas y mecanismos. 3a ed. México [etc.]: McGraw-Hill, cop. 2005. ISBN 9789701046562.

Shigley, Joseph Edward; Uicker, John Joseph. Teoría de máquinas y mecanismos. México [etc.]: McGraw-Hill, 1982. ISBN 9789684512979.

Khamashta Shahin, Munir; Álvarez Martínez, Lorenzo; Capdevila Pagés, Ramón. Problemas de cinemática y dinámica de máquinas. 2ª ed. corregida. Terrassa: Departament d'Enginyeria Mecànica, 1994. ISBN 8476530358.

Others resources:

ATENEA documents