



Universitat de Lleida

DEGREE CURRICULUM

THEORY OF MECHANISMS

Academic year 2014-15

Subject's general information

Subject name	Theory of Mechanisms
Code	102110
Semester	1st semester
Typology	Mandatory
ECTS credits	6
Theoretical credits	0
Practical credits	0
Office and hour of attention	Joan Roca Enrich Monday, 17 to 18. Wednesday, 12 to 13 Martí Comellas Andrés Jordi Pijuan Cases
Department	Informàtica i Enginyeria Industrial
Teaching load distribution between lectures and independent student work	Face to face: 40 % Autonomous work: 60 %
Modality	Presencial
Important information on data processing	Consult this link for more information.
Language	Catalan
Degree	Degree in Mechanical Engineering and Degree in Industrial Electronics and Automation Engineering
Distribution of credits	Joan Roca Enrich Martí Comellas Andrés Jordi Pijuan Cases
Office and hour of attention	Joan Roca Enrich Monday, 17 to 18. Wednesday, 12 to 13 Martí Comellas Andrés Jordi Pijuan Cases
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Subject's extra information

The main background needed to take advantage of the subject are: operations with vectors, trigonometry, derivatives and integrals of one variable, graphical representation of multi-body systems, dynamics of a mass particle

It is essential to have studied previously, and it is advisable to have passed the following subjects:

- Linear Algebra
- Calculus
- Physics I
- Graphics Expression I

Learning objectives

See competences.

Competences

Degree specific competences

- Knowledge of the principles of theory of machines and mechanisms.

Cross-disciplinary competences

- Capacity to gather and interpret relevant data, within the area of study, to judge and think about relevant subjects of social, scientific and ethical nature..
- Capacity to solve problems and prepare and defence arguments inside the area of studies.
- Capacity to work in situations with a lack of information and/or under pressure.

Subject contents

1. Rigid body kinematics
2. Rigid body dynamics: momentum and angular momentum
3. Introduction to mechanisms
4. Mobility of mechanisms
5. Mechanism kinematics

6. Mechanism dynamics: vectorial theorems
7. Energy theorem applied to mechanism dynamics

Methodology

Theory class: Presentations are available in SAKAI before class starts.

Problems class: Solving problems, questions and exercises. Solved exercises are available in SAKAI

3 laboratory sessions will take place during the semester, one using a CAD software and two in the laboratory of machines. The main objective of them is to provide the necessary knowledge to help the students to carry out the re-design project in groups. Attendance at laboratory practices is mandatory.

Evaluation

There will be some different evaluation activities:

- 1st individual written exam
- Reports from the laboratory sessions
- Work in group
- 2nd individual written exam
- Make-up exam of the 2nd individual one

The percentage assigned to each evaluation activity, of total of 100, is as follows:

Activity	Percentatge
1st individual exam	25
Laboratory sessions	10
Work in group	20
2nd individual exam	45
Make-up exam of the 2nd individual one	45

Bibliography

BEDFORD, A. & FOWLER, W. (1996) *Mecánica para Ingeniería. Dinámica*. Addison-Wesley Iberoamericana.E.U.A.

BEER, F.P. & JOHNSTON, E.R. (1998) *Mecánica Vectorial para ingenieros. Dinámica*. McGraw Hill.

- HIBBELER, R.C.(1996) *Ingeniería Mecánica. Dinámica*.Prentice-Hall Hispanoamericana. México.
- MERIAM, J.L. & KRAIGE, L.G.(1998) *Engineering Mechanics. Dynamics*.John Wiley & Sons. USA.
- MYSZKA,D. (1998) *Machines and Mechanisms. Applied Kinematic Analysis*. Prentice Hall. New Jersey.
- CARDONA, S. et al. (1998) *Teoria de Màquines*. Ed. CPDA-ETSEIB.Barcelona.
- MABIE, H & REINHOLTZ, C. (1998) *Mecanismos y Dinámica de Maquinaria*. Limusa.México.
- RIBA, C. (1995) *Dissenyde Màquines I. Mecanismes*. Edicions UPC. Barcelona.
- NORTON, R.L. (1995) *Diseño de Maquinaria*. McGraw Hill. México.
- SHIGLEY & MISCHKE.*Diseño en Ingeniería Mecánica*. McGraw Hill.