



Universitat de Lleida

DEGREE CURRICULUM
THEORY OF MACHINES

Academic year 2014-15

Subject's general information

Subject name	Theory of Machines
Code	102303
Semester	1rst semester continuous evaluation
Typology	Compulsory
ECTS credits	6
Theoretical credits	3
Practical credits	3
Office and hour of attention	Thursday from 17 to 19h room 1.11 del CREA
Department	Informàtica i Enginyeria Industrial
Teaching load distribution between lectures and independent student work	Face to face: 40 % Self study: 60 %
Modality	Presencial
Important information on data processing	Consult this link for more information.
Language	Catalan Part of the material will be in Spanish and English
Degree	Degree in Engineering Mechanics
Office and hour of attention	Thursday from 17 to 19h room 1.11 del CREA
E-mail addresses	roger.mari@diei.udl.cat

Roger Marí López

Subject's extra information

Suggestions

The previous knowledges necessary for the proper monitoring of the course are:

Vector operations, trigonometry, derivatives and integrals of one variable, flowcharting and graphic representation of sound systems, kinematics and dynamics of rigid solid with movimiento in the plane, kinematic and dynamic analysis of mechanisms movimiento in the plane.

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

Lineal algebra
Calculation
Physics I
Graphic Expression I
Theory of Mechanisms

The course as part of the academic plan

This course is offered during the 1st semester of the 3rd year of the Degree in Mechanical Engineering.

Learning objectives

See competence section.

Competences

Degree-specific competences

- Knowledge and ability to do calculus, design and machine trials.

Goals

- Making the design of a mechanism at a cinematic level from the specifications of the positions of its members.
- Kinematically analyze the mechanisms that incorporate flat cams.
- Kinematically and dynamically analyze gear drives.
- Study transmission systems in machines at actuation level and regularity of operation.
- Studying simple vibrating systems with one degree of freedom

Degree-transversal competences

- Ability to resolve problems and elaborate and defend arguments inside their field of study
- Ability to analyse and synthesiz

Subject contents

1. SUMMARY CHART OF MECHANISMS
2. CAM
3. GEARS
4. DYNAMICS OF MACHINES WITH A DEGREE OF FREEDOM

5. INTRODUCTION TO THE VIBRATIONS OF A DEGREE OF FREEDOM

Methodology

During the course, the basics of each subject will be briefly set out, especially in large group classes. In parallel, they be dealt in a practical way, mainly in half group classes and in autonomous work of students through case studies and problem solving.

3 practices, on in the CAD classroom and two in the laboratory of machines in CREA, on the dates set throughout the semester and corresponding schedule half group classes will be held. Attendance at practices is mandatory.

In the middle of the semester, the statement of an essay on the dynamic analysis of a machine in cyclic operation will be set, students must carry out the essay along the course in groups of 3 or 4 students.

Evaluation

Several activities of evaluation will be realized:

- 1st written individual test to halfway though the semester (week 9). There will be evaluated the agenda exposed in class and worked up to the date of the first test. The test will consist of a part of multiresponse questions and of a part of problems to developing, of that a minimal note of 3,5 has to be achieved out of 10 to overcome the subject.
- Practices, which are obligatory and of which the formless correspondent realized in group will be evaluated.
- Essay of dynamic analysis of a machine in cyclical system, which will be realized in group.
- 2nd written test at the end of the semester (week 17 or 18), of which a minimal note of 3,5 has to be achieved out of 10 to overcome the subject. There will be evaluate, principally, the agenda exposed in class and worked between the dates of first and second tests. The test will consist of a part of multiresponse questions and of a part of problems to developing.
- Retake of first and second written tests (week 20)

Activitat	Pes
1rst written test	25
Practices	10
Group essay	20
2nd written test	45
Retake of first and/or second written tests	25/45

Bibliography

Apunts de l'assignatura: "Teoria de Màquines".

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.

NORTON, R.L. (1995) Diseño de Maquinaria. McGraw Hill. México.

SHIGLEY & MISCHKE. Diseño en Ingeniería Mecánica. McGraw Hill.