

28824 - Machines: Calculus and Design

Información del Plan Docente

Academic Year	2017/18
Faculty / School	175 - Escuela Universitaria Politécnica de La Almunia
Degree	424 - Bachelor's Degree in Mechatronic Engineering
ECTS	6.0
Year	3
Semester	First semester
Subject Type	Compulsory
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The learning process designed for this subject is based on the following:

- **Theory Classes** : Theoretical activities carried out mainly through exposition by the teacher, where the theoretical supports of the subject are displayed, highlighting the fundamental, structuring them in topics and or sections, interrelating them.

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- **Practical Classes** : The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.
- **Individual Tutorials** : Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online.

5.2.Learning tasks

The subject will have the following overall distribution:

- 54 hours of lectures, with 20% theoretical demonstration and 80% solving type problems.
- 6 hours of written assessment tests, one hour per test.
- 90 hours of personal study, divided up over the 15 weeks of the 2 nd semester.

There is a tutorial calendar timetable set by the teacher that can be requested by the students who want a tutorial.

5.3.Syllabus

Unit 1. Design by Static Resistance

1.0. Review of straight beams and element design

1.1. Curved beams

1.2. Beams of variable section

1.3. Contact stress

1.4. Stress Concentrators

1.5. Failure Theories for Static Load

Unit 2. Dynamic Resistance Design

2.1. Dynamic loads

2.2. Design to impact loads

2.3. Fatigue Resistance Design

Unit 3. Securing and transmitting elements

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3.1. Gears

3.2. Shafts and trees

3.3. Screws and bolts

5.4. Course planning and calendar

The dates of the final exams will be those that are officially published at <http://www.eupla.es/secretaria/academica/examenes.html>.

The written assessment tests will be related to the following topics:

— **Test 1** : Topic 1.

— **Test 2** : Topic 2.

— **Test 3** : Topic 3.

The topics used for the PPT presentations will be proposed before Week 3, and the exhibition will be before week 13.

5.5. Bibliography and recommended resources

THE UPDATED BIBLIOGRAPHY OF THE SUBJECT IS CONSULTED VIA THE LIBRARY'S WEB PAGE

<http://psfunizar7.unizar.es/br13/egAsignaturas.php?codigo=28824&Identificador=14378>

BB Budynas, Richard G.. Diseño en ingeniería mecánica de Shigley / Richard G. Budynas, J. Keith Nisbett ; revisión técnica, Jesús Manuel Dorador González ... [et al.] . - 9ª ed. México [etc.] : McGraw-Hill, cop. 2012

BB Hamrock, Bernard J.. Elementos de máquinas / Bernard J. Hamrock, Bo O. Jacobson, Steven R. Schmid México [etc.] : McGraw-Hill, 2000

BC Mott, Robert L.. Diseño de elementos de máquinas / Robert L. Mott ; traducción Virgilio González y Pozo ; revisión técnica Sergio Saldaña Sánchez, Ángel Hernández Fernández, Jaime Villanueva Sánchez . - 4ª ed. México [etc.] :

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Pearson Educación, 2006

BC Norton, Robert L.. Diseño de maquinaria : síntesis y análisis de máquinas y mecanismos / Robert L. Norton ; revisión técnica, Miguel Angel Ríos Sánchez . - 4ª ed. Mexico [etc.] : McGraw-Hill, cop. 2009

BC Timoshenko, Stephen P.. Mecánica de materiales / Stephen P. Timoshenko, James M. Gere México [etc.] : Unión Tipográfica Editorial Hispano- americana, 1974