

Course guide

205606 - 205606 - Simulation and Mechanical Design

Last modified: 19/04/2023

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering

Teaching unit: 712 - EM - Department of Mechanical Engineering.

Degree: MASTER'S DEGREE IN RESEARCH IN MECHANICAL ENGINEERING (Syllabus 2021). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 4.5 **Languages:** Catalan

LECTURER

Coordinating lecturer: Domenèch Mestres, Carlos

Others: Blanco Romero, Maria Elena
Caballero Flores, David
Domenèch Mestres, Carlos

PRIOR SKILLS

Knowledge of machine design

TEACHING METHODOLOGY

The teaching methodology is based on two types of activities.

Classes in which the teacher provides concepts and knowledge and through practical exercises illustrates how to apply knowledge exposed to situations and solving real problems. It is a class of 1 hours each week.

Practical sessions in small groups in which students perform activities under the supervision of a teacher.

There are practical sessions where the students become familiar with various aspects of machine design methodology guided by the teacher in the perspective of the job done for the course. It is a session of 2 hours every week.

The work of the course is delivered at the end of the course.

LEARNING OBJECTIVES OF THE SUBJECT

Objective: To ensure that students acquire knowledge of simulations and mechanical design. To integrate the tools and the knowledge acquired in other subjects in the development of mechanical projects.

STUDY LOAD

Type	Hours	Percentage
Hours small group	18,0	16.00
Self study	72,0	64.00
Hours large group	22,5	20.00

Total learning time: 112.5 h

CONTENTS

Simulation and mechanical design tools

Description:

3D design. Design of parts and assemblies with Creo PTC
Detail design. Elaboration of drawings with Creo PTC
Simulation of mechanisms with Creo PTC
Finite element simulation with Creo PTC

Specific objectives:

Integrate all the knowledge acquired in other subjects.

Full-or-part-time: 49h

Theory classes: 10h

Practical classes: 7h 30m

Self study : 31h 30m

Project

Description:

It will be conducted individually at home and at practical classes following the directions of these practical classes.
It consists in the practical application of the simulaci3n ad mechanical design tools presented during this course and in previous matters of the master.

Full-or-part-time: 63h 30m

Theory classes: 12h 30m

Laboratory classes: 10h 30m

Self study : 40h 30m

GRADING SYSTEM

The rating system is:

Work the subject A: 3/10 points

Work the subject B: 4/10 points

Final exam: 3/10 points

EXAMINATION RULES.

The final delivery of each work and partial deliveries (weekly or fortnightly) are mandatory.

BIBLIOGRAPHY

Basic:

- Riba i Romeva, Carles. Diseño concurrente [on line]. Barcelona: Edicions UPC, 2002 [Consultation: 23/01/2023]. Available on: <http://hdl.handle.net/2099.3/36754>. ISBN 8483015986.
- Gomeringer, Roland. Mechanical and metal trades handbook. 4th ed. Haan-Gruiten: Verlag Europa-Lehrmittel, 2018. ISBN 9783808519158.
- Riba i Romeva, Carles. Disseny de màquines [on line]. 3a ed. Barcelona: Edicions UPC, 2001- [Consultation: 25/01/2023]. Available on: <http://hdl.handle.net/2099.3/36688>. ISBN 8483015501.
- Riba i Romeva, Carles. Selección de materiales en el diseño de máquinas [on line]. Barcelona: Edicions UPC, DL 2008 [Consultation: 25/01/2023]. Available on: <http://hdl.handle.net/2099.3/36844>. ISBN 9788483017388.



Complementary:

- Mott, Robert L. [et al.]. Diseño de elementos de máquinas. 4ª ed. México [etc.]: Prentice Hall, 2006. ISBN 9702608120.
- Budynas, Richard G.; Nisbett, J. Keith. Diseño en ingeniería mecánica de Shigley. 10ª ed. Ciudad de México: McGraw-Hill, 2019. ISBN 9781456267568.