Course guide
220214 - 220214 - Theory and Design of Structures

Last modified: 19/04/2023

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 737 - RMEE - Department of Strength of Materials and Structural Engineering.

Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 2.5 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Sanchez Romero, Montserrat

Others: Fernández Doblas, Sebastián

PRIOR SKILLS

Background knowledge of continuum mechancis, elasticity and strength of materials, matrix algebra and theory of structures.

REQUIREMENTS

undefined.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Knowledge and skills for the calculation and design of structures.

TEACHING METHODOLOGY

Large group sessions: these sessions will be devoted to present the fundamental background of the subject, the problems solutions and the corresponding evaluations. A lecture-type model will be used according to the professor criteria demms most approproate to achive the goals that have been set for the course.
Small group sessions: these sessions will be devoted to solve problems and address experimental procedures proposed either by the professor or students. Its resolution is part of the autonomous learning.

LEARNING OBJECTIVES OF THE SUBJECT

The objective of this course is to provide to students the tools and knowledge necessary in disciplines dealing design of structural elements.

STUDY LOAD

Type	Hours	Percentage
Hours large group	15,0	24.00
Self study	40,0	64.00
Hours small group	7,5	12.00

Total learning time: 62.5 h

CONTENTS

Introduction to design and structural analysis

Full-or-part-time: 5h
Theory classes: 2h
Laboratory classes: 1h
Self study : 2h

Theoretical background

Full-or-part-time: 7h
Theory classes: 2h
Laboratory classes: 1h
Self study : 4h

Structural elements

Full-or-part-time: 13h
Theory classes: 3h
Laboratory classes: 2h
Self study : 8h

Structural materials

Description:
(ENG) Estructures metàl·liques
Estructures de formigó
Estructures de materials avançats

Full-or-part-time: 37h 30m
Theory classes: 8h
Laboratory classes: 3h 30m
Self study : 26h

GRADING SYSTEM

Final exam: 50%
Proposed activity: 30%
Problems and assignments: 20%

Mechanisms for addressing unsatisfactory scores:
There will be an option to take a recovery test to address an unsatisfactory final test score.
The recovery test score will be capped to a 5.00/10.00 and it will replace the global test score if it is higher.
This test will be held in a special date and will be open to all interested students.

EXAMINATION RULES.

Habitual ones.

BIBLIOGRAPHY

Basic:

- Cervera Ruiz, M.; Blanco, E. Mecánica de estructuras, vol. 2, Métodos de análisis [on line]. 2a ed. Barcelona: Edicions UPC, 2002 [Consultation: 08/01/2016]. Available on: http://hdl.handle.net/2099.3/36196. ISBN 8483016232.
- Hibbeler, Russell C. Structural analysis. 8th ed. Upper Saddle River: Prentice Hall, 2012. ISBN 9780132570534.
- Megson, T.H.G. Structural and stress analysis [on line]. 2nd ed. Amsterdam: Butterworth-Heinemann, 2005 [Consultation: 03/10/2022]. Available on: https://www-sciencedirect-com.recursos.biblioteca.upc.edu/book/9780750662215/structural-and-stress-analysis. ISBN 9780750662215.

Complementary:

- McKenzie, W.M.C. Design of structural elements to Eurocodes [on line]. 2nd ed. Houndmills, UK: Palgrave Macmillan, 2013 [Consultation: 15/06/2022]. Available on: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=4762833. ISBN 9780230217713.