

## 220214 - Theory and Design of Structures

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
Teaching unit: 737 - RMEE - Department of Strength of Materials and Structural Engineering  
Academic year: 2019  
Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Compulsory)  
ECTS credits: 2,5 Teaching languages: Catalan, Spanish

### Teaching staff

Coordinator: Sanchez Romero, Montserrat

Others: Fernández Doblas, Sebastián

### Opening hours

Timetable: To be defined.

### Prior skills

Background knowledge of continuum mechanics, 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 deemed most appropriate to achieve 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.

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### Study load

Total learning time: 62h 30m	Hours large group:	15h	24.00%
	Hours medium group:	0h	0.00%
	Hours small group:	7h 30m	12.00%
	Guided activities:	0h	0.00%
	Self study:	40h	64.00%

### Content

Introduction to design and structural analysis	Learning time: 5h Theory classes: 2h Laboratory classes: 1h Self study : 2h
Theoretical background	Learning time: 7h Theory classes: 2h Laboratory classes: 1h Self study : 4h
Structural elements	Learning time: 13h Theory classes: 3h Laboratory classes: 2h Self study : 8h
Structural materials	Learning time: 37h 30m Theory classes: 8h Laboratory classes: 3h 30m Self study : 26h
Description: (ENG) Estructures metàl·liques Estructures de formigó Estructures de materials avançats	

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### Qualification 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.

### Regulations for carrying out activities

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: 05/03/2014]. Available on: <<http://www.sciencedirect.com/science/book/9780750662215>>. ISBN 9780750662215.

Complementary:

McKenzie, W.M.C. Design of structural elements. Palgrave Macmillan, 2003. ISBN 9781403912244.

Others resources: