

# Structural Analysis Seminars (250706)

## General Information

School	ETSECCPB
Departments	Centre Internacional de Mètodes Numèrics en Enginyeria (CIMNE) Departament d'Enginyeria Civil i Ambiental (DECA)
Credits	2.5 ECTS
Programs	MÀSTER UNIVERSITARI EN ENGINYERIA ESTRUCTURAL I DE LA CONSTRUCCIÓ (pla 2015)
Course	2024/25

## Main teaching language at each group

- Group 10EN2 English (Q2)

## Faculty

Responsible Faculty: Luis Miguel Cervera Ruiz  
Faculty: Luis Miguel Cervera Ruiz, Narges Dialamishabankareh Soltani

## Objectives of Education

Subject to acquire knowledge on trends in research related to structural analysis

Capability to acquire the latest knowledge on research issues related to structural analysis

Recent advances in research topics related to structural analysis

This course aims to give an overview about the possibilities offered by numerical simulation in the structural analysis. The student will be able to exercise in different aspects of the structural calculation. All the necessary knowledge will be reviewed and appropriate calculation tools (software, interfaces, etc.) will be provided.

## Competencies

### Generic

To conceive, design, analyze and manage structures or structural elements of civil engineering or building, encouraging innovation and the advance of knowledge.  
To develop, improve and use conventional materials and new construction techniques to ensure the safety requirements, functionality, durability and sustainability.

## Total hours of student work

		Hours	Percentage
Supervised Learning	Large group	12.75 h	56.64 %
	Medium group	4.88 h	21.68 %
	Laboratory classes	4.88 h	21.68 %
	Guided Activities	0.0 h	0.00 %
Self Study		40.0 h	

# Contents

## Introduction

Introduction: course objectives, the format of the lessons, tasks

## Geometric modeling and meshing

Software Introduction  
Tutorial geometric modeling  
Tutorial discretization

## Solid Mechanics

Stresses and strains  
Elasticity and elastic problem

## Structural analysis

Static analysis 2D and 3D

## Dynamic Analysis

Dynamic analysis of structures in bars and continue on.

## Activities

### Thin plate with own weight

Dedication

2h

### Cantilevered transverse load on the end

Dedication

2h

### Flat structure with holes and coulmnas

Dedication

2h

### Large edge beam with hole

Dedication

2h

### Section of tunnel

Dedication

2h

### Cylindrical tank

Dedication

2h

### **A foundation corner column**

**Dedication**

2h

### **Laminar cylindrical tank domed**

**Dedication**

2h

### **Arcaded building structure**

**Dedication**

2h

### **Frequencies and modes own structure folded sheets**

**Dedication**

2h

## **Teaching Methodology**

The course consists of 0,8 hours per week of classroom activity (large size group).

The 0,8 hours in the large size groups are devoted to theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises.

Support material in the form of a detailed teaching plan is provided using the virtual campus ATENEA: content, program of learning and assessment activities conducted and literature.

Although most of the sessions will be given in the language indicated, sessions supported by other occasional guest experts may be held in other languages.

## **Grading Rules**

*(\*) The evaluation calendar and grading rules will be approved before the start of the course.*

Continuous assessment consists of different activities, both individual and group formative in nature, made during the course (in the classroom and outside it). Assessment tests consist of a set of application exercises according to the themes developed in the course. The rating is calculated as an average of the work done throughout the course.

## **Test Rules**

Failure to perform a laboratory or continuous assessment activity in the scheduled period will result in a mark of zero in that activity.

## **Office Hours**

In class and during the two hours after class.

## **Bibliography**

### **Basic**

- Bathe, Klaus-Jürgen. [Finite element procedures](#). [S. l.]: l'autor, cop. 2006. ISBN 9780979004902.
- Zienkiewicz, O. C; Taylor, Richard Lawrence; Fox, D. D. [The Finite element method : for solid & structural mechanics](#). 7th ed. Amsterdam [etc.]: Elsevier Butterworth-Heinemann, 2014. ISBN 9781856176347.

