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 - (codi pla 1140)
Course:	2015/2016
Course language:	Castellano

Faculty

Responsible faculty: Luis Miguel Cervera Ruiz

Teacher: Luis Miguel Cervera Ruiz

Generic objectives

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.

Skills

Generic skills of subject

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.

ECTS credits: total hours of student work

Egge	Dedication	

		Hours	Percent
Supervised Learning	Theory	5.00	40.0%
	Assignments	0.00	0.0%
	Laboratory	7.50	60.0%
	Supervised activities	22.00	176.0%
Self-Learning		50.00	

Contents

Introduction

Dedication

1.0h. Theory

Description

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

Geometric modeling and meshing

Dedication

5.5h. Laboratory

Description

Software Introduction

Tutorial geometric modeling

Tutorial discretization

Solid Mechanics

Dedication

2.0h. Theory

Description

Stresses and strains

Elasticity and elastic problem

Structural analysis

Dedication

2.0h. Theory

Description

Static analysis 2D and 3D

Dynamic Analysis

Dedication

2.0h. Laboratory

Description

Dynamic analysis of structures in bars and continue on.

Activities

Thin plate with axial load

Dedication

2.0 h. Supervised activities

Thin plate with own weight

Dedication

2.0 h. Supervised activities

Cantilevered transverse load on the end

Dedication

2.0 h. Supervised activities

Flat structure with holes and coulmnas

Dedication

2.0 h. Supervised activities

Large edge beam with hole

Dedication

2.0 h. Supervised activities

Section of tunnel

Dedication

2.0 h. Supervised activities

Cylindrical tank

Dedication

2.0 h. Supervised activities

A foundation corner column

Dedication

2.0 h. Supervised activities

Laminar cylindrical tank domed

Dedication

2.0 h. Supervised activities

Escola de Camins

Arcaded building structure

Dedication

2.0 h. Supervised activities

Frequencies and modes own structure folded sheets

Dedication

2.0 h. Supervised activities

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.

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.

Office hours

In class and during the two hours after school.

Basic bibliography

- KJ Bather. Finite Element Procedures. Prentice Hall. 1986.
- Zienkiewicz, OC, Taylor, RL. The Finite Element Method for Solid and Structural Mechanics. Elsevier Butterworth-Heinemann. 2005..