

60824 - Computer simulation in structural engineering

Syllabus Information

Academic Year: 2020/21

Subject: 60824 - Computer simulation in structural engineering

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 532 - Master's in Industrial Engineering

ECTS: 6.0

Year: 2

Semester: First semester

Subject Type: Optional

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It is based on an active learning framework so the course is structured as follows:

- Acquisition of theoretical concepts by means of lectures and problem-solving tasks.
- Laboratory assignments will be solved with the help of the instructors. At the same time, a project will be developed throughout the course that applies the fundamental topics of the course.
- During office hours, students will be able to review their learning outcomes.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials.

4.2.Learning tasks

The course includes the following learning tasks:

- **Lectures.** The following concepts will be analysed in depth:
 - Brief overview of the basic concepts of continuum mechanics.
 - Geometrical modeling and meshing
 - Advanced structural analysis

- Non linear simulation
- **Laboratory sessions**
- **Projects**
- **Tutorials**

4.3.Syllabus

The course will address the following topics:

1. Overview of linear elasticity
2. Finite elements for linear elasticity
3. Introduction to non-linear structural mechanics
4. Non-linear kinematics
5. Stress measures. Equilibrium
6. Constitutive equations
7. Introduction to plasticity
8. Large strain plasticity
9. Linearised equilibrium equations
10. Boundary conditions

4.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website.

4.5.Bibliography and recommended resources