

## 66423 - Methods of analysis for structural mechanics

### Información del Plan Docente

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|------------------------|--|
| <b>Academic Year</b>   | 2016/17                                    |
| <b>Academic center</b> | 110 - Escuela de Ingeniería y Arquitectura |
| <b>Degree</b>          | 536 - Master's in Mechanical Engineering   |
| <b>ECTS</b>            | 6.0  |
| <b>Course</b>          | 1  |
| <b>Period</b>          | First semester                             |
| <b>Subject Type</b>    | Compulsory                                 |
| <b>Module</b>          | ---  |

### **1.Basic info**

#### **1.1.Recommendations to take this course**

#### **1.2.Activities and key dates for the course**

### **2.Initiation**

#### **2.1.Learning outcomes that define the subject**

#### **2.2.Introduction**

### **3.Context and competences**

#### **3.1.Goals**

#### **3.2.Context and meaning of the subject in the degree**

#### **3.3.Competences**

#### **3.4.Importance of learning outcomes**

### **4.Evaluation**

### **5.Activities and resources**

#### **5.1.General methodological presentation**

The learning process that is designed for this subject is based on the following:

In order to achieve the learning outcomes described above and acquire the skills designed for this subject, the following training activities are proposed:

Lecture participatory A01 (15 contact hours) .Exposición by the teacher of the main contents of the subject. This activity will take place in the classroom in person.

Block I: Experimental techniques.

Measurement of residual stresses in parts by extensometer.

experimental characterization of vibration and noise.

Universal testing machines. Characterisation of materials.

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experimental simulation of actual behavior of mechanical prototypes.

Block II: Computational methods.

computational mesh processing tools.

Tools computations based on the finite element method.

structural analysis computational tools in building.

A02 Troubleshooting and cases (15 contact hours). These classes are also conducted in the same classroom lectures participatory.

Resolving issues with Blocks I and II

A03 Labs. (25 contact hours).

Introduction to using techniques of experimental characterization of structures

Introduction to handling structural calculation software

A04 Special practices (5 hours attendance).

A05 Carrying out practical work or research application. (40 hours of personal work) .The student will study several real cases that will propose the teacher. These works may be individual or in pairs, depending on the number of students.

They should analyze these cases and seek the additional information necessary for full understanding. The student will prepare a report for each commissioned work and deliver it to the teacher. This work will be defended orally to the subject teachers and other students.

1. Numerical-experimental activity correlation of a real case.

A06: Tutoring. (5 hours) Hours personalized attention to students with the aim of reviewing and discussing the materials and topics presented in both theoretical and practical classes.

A07: Study of theory. (42 hours)

A08: Evaluation. (3 hours) A set of theoretical and reporting practices or work used in the assessment of student learning process written tests

### 5.2.Learning activities

The program that the student is offered to help you achieve the expected results includes the following activities ... Using computational analysis techniques stress states mechanical components and structural elements. Computer simulation of the behavior of materials through the constitutive laws of materials Experimental characterization of the mechanical properties of different materials by universal testing machines . Experimental techniques for measuring residual stress in pieces by extensometry .

### 5.3.Program

Block I: Experimental techniques . Measurement of residual stresses in parts by extensometer . Experimental characterization of vibration and noise. Universal testing machines . Characterisation of materials . Experimental simulation of actual behavior of mechanical prototypes. Block II : Computational methods . Computational mesh processing tools . Tools computations based on the finite element method . Structural analysis computational tools in building.

### 5.4.Planning and scheduling

Schedule sessions and presentation of works The schedule of the course , both of the sessions in the classroom and laboratory sessions , will be determined by the academic calendar that the center established for the corresponding course. The schedule for submission of papers shall be announced at the beginning of the course.

### 5.5.Bibliography and recommended resources

No bibliographic records for this subject