Degree competences to which the subject contributes

**Generical:**
13360. To conceive, design, analyze and manage structures or structural elements of civil engineering or building, encouraging innovation and the advance of knowledge.
13361. To develop, improve and use conventional materials and new construction techniques to ensure the safety requirements, functionality, durability and sustainability.

Learning objectives of the subject

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.
## Study load

<table>
<thead>
<tr>
<th></th>
<th>Time (hours)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes:</td>
<td>10h 49,8m</td>
<td>17.32%</td>
</tr>
<tr>
<td>Practical classes:</td>
<td>5h 25,8m</td>
<td>8.69%</td>
</tr>
<tr>
<td>Laboratory classes:</td>
<td>5h 25,8m</td>
<td>8.69%</td>
</tr>
<tr>
<td>Guided activities:</td>
<td>0h 49,8m</td>
<td>1.33%</td>
</tr>
<tr>
<td>Self study:</td>
<td>40h</td>
<td>63.98%</td>
</tr>
</tbody>
</table>
## Total learning time

<table>
<thead>
<tr>
<th>Total learning time:</th>
<th>62h</th>
</tr>
</thead>
</table>

| 31.2m |   |
## Content

### Introduction

**Learning time:** 2h 24m  
Theory classes: 1h  
Self study: 1h 24m

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

### Geometric modeling and meshing

**Learning time:** 13h 12m  
Laboratory classes: 5h 30m  
Self study: 7h 42m

**Description:**  
Software Introduction  
Tutorial geometric modeling  
Tutorial discretization

### Solid Mechanics

**Learning time:** 12h  
Laboratory classes: 5h  
Self study: 7h

**Description:**  
Stresses and strains  
Elasticity and elastic problem

### Structural analysis

**Learning time:** 12h  
Laboratory classes: 5h  
Self study: 7h

**Description:**  
Static analysis 2D and 3D

### Dynamic Analysis

**Learning time:** 12h  
Laboratory classes: 5h  
Self study: 7h

**Description:**  
Dynamic analysis of structures in bars and continue on.
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.

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

**Bibliography**

**Basic:**