

## 28838 - Structures: Design and Calculations

### Información del Plan Docente

<b>Academic Year</b>	2016/17
<b>Academic center</b>	175 - Escuela Universitaria Politécnica de La Almunia
<b>Degree</b>	424 - Bachelor's Degree in Mechatronic Engineering
<b>ECTS</b>	6.0
<b>Course</b>	4
<b>Period</b>	Second semester
<b>Subject Type</b>	Optional
<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 designed for this subject is based on the following:

Presentation general methodology

Strong interaction between the teacher/student. This interaction is brought

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into being through a division of work and responsibilities between the students and the teacher. Nevertheless, it must be taken into account that, to a certain degree, students can set their learning pace based on their own needs and availability, following the guidelines set by the teacher.

The current subject is conceived as a stand-alone combination of contents, yet organized into three fundamental and complementary forms, which are: the theoretical concepts of each teaching unit, the solving of problems or resolution of questions and laboratory work, at the same time supported by other activities

The organization of teaching will be carried out using the following steps:

– **Theory Classes** : Theoretical activities carried out mainly through exposition by the teacher, where the theoretical supports of the subject are displayed, highlighting the fundamental, structuring them in topics and or sections, interrelating them.

– **Practical Classes** : The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.

– **Individual Tutorials** : Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online.

### 5.2.Learning activities

Programmed learning activities

The programme offered to the student to help them achieve their target results is made up of the following activities...

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Involves the active participation of the student, in a way that the results achieved in the learning process are developed, not taking away from those already set out, the activities are the following:

– **Face-to-face generic activities :**

• **Theory Classes :** The theoretical concepts of the subject are explained and illustrative examples are developed as support to the theory when necessary.

• **Practical Classes :** Problems and practical cases are carried out, complementary to the theoretical concepts studied.

– **Generic non-class activities :**

• Study and understanding of the theory taught in the lectures.

• Understanding and assimilation of the problems and practical cases solved in the practical classes.

• Preparation of seminars, solutions to proposed problems, etc.

• Preparation of the written tests for continuous assessment and final exams.

The subject has 6 ECTS credits, which represents 150 hours of student work in the subject during the trimester, in other words, 10 hours per week for 15 weeks of class.

A summary of a weekly timetable guide can be seen in the following table. These figures are obtained from the subject file in the Accreditation Report of the degree,

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taking into account the level of experimentation considered for the said subject is moderate.

Activity	Weekly school hours
Lectures	4
Other Activities	6

### 5.3.Program

#### Set of topics

Topic 1. Actions on buildings

Topic 2. Hyperstatic frame structure calculation.

Beams

Cross Method

Topic 3. Frame forces

Topic 4. Frame dimensioning

Topic 5. Anchorage dimensioning

Topic 6. Foundations

Topic 7. Armors

### 5.4.Planning and scheduling

#### Calendar of meetings attend them and presentation of works

The dates of both final examinations will be the published ones of official form in <http://www.eupla.es/secretaria/academica/examenes.html> .

The dates of the partial tests will communicate to the beginning of the classes.

**5.5. Bibliography and recommended resources**

- Ingeniería geológica / Luis I. González de Vallejo...[et al.] Madrid [etc.] : Prentice Hall, 2006
- Geotécnia y cimientos. V. 3, Cimentaciones, excavaciones y aplicaciones de la geotecnia / coordinador y director edición, José Antonio Jiménez Salas ; Luis del Cañizo Perate...[et al.] Madrid : Rueda, D.L. 1980
- Peck, Ralph B.. Ingeniería de cimentaciones / Ralph B. Peck, Walter E. Hanson, Thomas H. Thornburn, [versión española Jose Luis Lepe Saucedo; revisión Hermilo del Castillo Mejía] México [etc.] : Limusa, cop. 2004
- Muzás Labad, Fernando. Mecánica del suelo y cimentaciones / Fernando Muzas Labad. - 1ª edición Madrid : Fundación Escuela de la Edificación, 2007
- Bowles, Joseph E. Foundation analysis and design / Joseph E. Bowles. - 4th ed New York [etc.] : McGraw-Hill, cop. 1988
- Sanz, Luis Javier; Salesa, Angel. Problemas resueltos de tecnología de estructuras/ Luis Javier Sanz; Angel Salesa.. - 1ª edición Zaragoza:Copycenter, 2011.
- Morales Palomino, Carlos. Diseño de plantas industriales / Sisenando Carlos Morales Palomino. - 1ª edición Madrid : Universidad Nacional de Educación a Distancia, 2011
- Jimenez Montoya, Pedro. Hormigón armado / Pedro Jiménez Montoya, Álvaro García Meseguer, Francisco Morán Cabré . - 14ª ed., [reimp.] Madrid : Gustavo Gili, 2000 (reimp. 2007)
- Calavera Ruiz, J.. Ejecución y control de estructuras de hormigón / J. Calavera Ruiz. - 1ª edición Madrid, : Intemac, 2004
- EFHE : Instrucción para el proyecto y ejecución de forjados unidireccionales de hormigón estructural realizados con elementos prefabricados / comentada y extractada en materiales, ejecución y control por Antonio Garrido Hernández . - 1ª ed. Madrid : Legran, 2002
- Calavera Ruiz, José. Cálculo de estructuras de cimentación / J. Calavera . - 4a. ed. [Madrid] : INTEMAC (Instituto Técnico de Materiales y Construcciones), D.L. 2000
- Heredia, Rafael de. Arquitectura y urbanismo industrial : diseño y construcción de plantas, edificios y polígonos industriales / Rafael de Heredia . - 2a. ed. Madrid : [Universidad Politécnica de Madrid], Sección de Publicaciones, D.L. 1981
- Casals, Miquel. Diseño de complejos industriales : fundamentos / Miquel Casals, Núria Forcada, Xavier Roca . - 1ª ed. Barcelona : Edicions UPC, 2008

**Material resources.**

Materials supplied during the development of the subject across the platform Moodle:

- Notes of theory

- Practical exercises

- Presentations used in class