

## 28948 - Engineering of green areas

### Información del Plan Docente

<b>Academic Year</b>	2016/17
<b>Academic center</b>	201 - Escuela Politécnica Superior
<b>Degree</b>	437 - Degree in Rural and Agri-Food Engineering
<b>ECTS</b>	6.0
<b>Course</b>	4
<b>Period</b>	Half-yearly
<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 designed for this course is based on the following methodologies: Theoretical sessions, Problem/project-based learning, and Computer lab sessions.

#### **5.2.Learning activities**

The program that the student is offered to achieve the expected results includes the following activities:

- Theoretical sessions (3 ECTS):

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- o The teacher explains the theoretical content of each session. One of the objectives of this activity will be the promoting of the participation of the students and the cooperative learning.
- o Problem-solving sessions. The teacher will resolve specific problems.
- Practical sessions (3 ECTS):
  - o Problem-based learning. Students, working individually or in groups, gain knowledge and skills by working to respond problems and questions.
  - o Computer lab sessions. Students use specific structural calculation software.
  - o Project-based learning. Students gain knowledge and skills by working with examples of real projects.

### 5.3.Program

#### Theory program

##### MODULE 1. Basis for the calculation of structures

1. Structural typologies in fruit and vegetable and gardening buildings.
2. Building elements.
3. Actions on the building.
4. Load theory.

##### MODULE 2. Metallic structures

5. Properties of steel.
6. Characteristics of metallic structures: Gabled portico.
7. Calculating traction elements.
8. Calculating flexion elements.
9. Calculating compression elements.

##### MODULE 3. Reinforced and prefabricated concrete structures

10. Properties of prefabricated concrete.
11. Characteristics of reinforced concrete.
12. Calculating flexion elements.

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13. Calculating compression elements.

14. Justification and definition of structural elements from prefabricated concrete.

15. Construction details.

### MODULE 4. Foundations

16. Geotechnical parameters.

17. Types of foundations.

18. Calculating isolated footings.

### MODULE 5. Irrigation pools

1. Constituent elements.

2. Sizing criteria

### Practicals program

1. Calculating the actions on the building.

2. Determining load combinations for calculating the structures.

3. Calculating the isolated elements of a metallic structure: Pillars, beams and roof purlins.

4. Calculating a gabled portico made from prefabricated concrete using specific software.

5. Using commercial technical information on prefabricated concrete elements.

6. Calculating superficial foundations using isolated footings

### 5.4.Planning and scheduling

Week	Theoretical	Practical	Individual	Total (h)
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	sessions (h)	sessions (h)	work (h)	
1	2	2	6	10
2	2	2	6	10
3	2	2	6	10
4	2	2	6	10
5	2	2	6	10
6	2	2	6	10
7	2	2	6	10
8	2	2	6	10
9	2	2	6	10
10	2	2	6	10
11	2	2	6	10
12	2	2	6	10
13	2	2	6	10
14	2	2	6	10
15	2	2	6	10
<b>Total hours</b>	30	30	90	150

### 5.5. Bibliography and recommended resources

BB

España. Ministerio de Fomento. EHE-08 :  
 Instrucción de hormigón estructural : Con  
 comentarios de los miembros de la  
 Comisión Permanente del Hormigón /  
 Ministerio de Fomento. 3ª ed. Madrid :

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- Ministerio de Fomento, Secretaría General Técnica, 2009
- BB** España. Ministerio de la Vivienda. Código técnico de la edificación. Edición septiembre 2009 Madrid : La Ley, 2009
- BB** Estructuras de acero. [1] Cálculo / autores, Ramón Argüelles Álvarez ... [et al.] . 2ª ed. amp y act. Madrid : Bellisco, 2005
- BB** Estructuras de acero. [2], Uniones y sistemas estructurales / autores, Ramón Argüelles Álvarez ... [et al.]. 2ª ed. amp y act. Madrid : Bellisco, 2007
- BB** Jimenez Montoya, Pedro. Hormigón armado / Pedro Jiménez Montoya, Álvaro García Meseguer, Francisco Morán Cabré . 14ª ed., [reimp.] Madrid : Gustavo Gili, 2000 (reimp. 2007)
- CB** Calavera Ruiz, José. Cálculo de estructuras de cimentación / J. Calavera . 4a. ed. [Madrid] : INTEMAC (Instituto Técnico de Materiales y Construcciones), D.L. 2000
- CB** Calavera Ruiz, José. Una introducción a la prefabricación de edificios y naves industriales / J. Calavera Ruiz, J. Fernández Gómez . [Madrid : INTEMAC] , D.L.2001