

28948 - Engineering of green areas

Syllabus Information

Academic year: 2023/24

Subject: 28948 - Engineering of green areas

Faculty / School: 201 - Escuela Politécnica Superior

Degree: 583 - Degree in Rural and Agri-Food Engineering

ECTS: 6.0

Year:

Semester: Second semester

Subject type: Optional

Module:

1. General information

The main objective of the subject is that the student is able to: a) decide which structural typology and which construction materials are the most suitable according to the purpose of the agricultural building to be designed; b) design the structural calculation of a metallic agricultural building; c) design the structural calculation of a concrete agricultural building.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 () 2030 of the United Nations (<https://www.un.org/sustainabledevelopment/es/>), contributing to some extent to their achievement: Goal 9: Building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation.

Specifically with targets 9.1 and 9.4.

2. Learning results

1. Describe the construction materials most commonly used in infrastructures and buildings used in the sector of green areas and fruit and vegetable farms.
2. Apply the regulations to be complied with related to the calculation of metallic and reinforced or precast concrete structures.
3. Describe the most common structural typologies of fruit and vegetable constructions.
4. Describe technically the structural elements most used in the infrastructures and buildings used in the green areas engineering and fruit and vegetable farms.
5. Justify the calculation of the structure of a gabled building made of steel and precast concrete.
6. Justify the dimensioning and calculation of reinforced concrete isolated surface foundations.

The learning results are aligned with SDG 9.

3. Syllabus

MODULE 1. Basis for the calculation of structures

1. Structural typologies in agricultural buildings.
2. Constructive Elements.
3. Actions in the building.
4. Load assumptions.

MODULE 2. Metal structures

5. Steel properties.
6. Characteristics of steel structures: gable frames.
7. Calculation of tensile elements.
8. Calculation of bending elements.
9. Calculation of compressed elements.

MODULE 3. Reinforced and precast concrete structures

10. Properties of reinforced concrete.
11. Characteristics of reinforced concrete structures
12. Calculation of bending elements.

13. Calculation of compression elements.
14. Justification and definition of precast concrete structural elements.
15. Construction details.

MODULE 4. Foundations

- 16- Geotechnical parameters.
- 17- Foundation typologies.
- 18- Calculation of isolated footings.

4. Academic activities

Lectures: 30 h

Theoretical-practical sessions in which the contents of the subject will be explained.

Problems and cases: 30 h

Sessions of problems and cases in which the contents of the subject will be developed: establishment of actions in the building, calculation of isolated structural elements, calculation of a gable porch in precast concrete, handling, handling of commercial technical information, calculation of foundations by means of isolated footings.

Personal study: 87 h

Assessment tests. 3 h

5. Assessment system

There will be a continuous assessment of the course that will include the following activities and assessment criteria:

1. Theoretical and practical exercises of construction calculations developed individually with computer applications. This activity will account for 65% of the final grade of the subject.
2. Final work of the subject consisting of the documentary presentation of the calculations related to a constructive project. The paper will be defended personally by each student in an oral session. This final work and its oral defense will represent 35% of the final grade of the subject.

Students who do not opt for continuous assessment or who do not pass the subject by this procedure or who would like to improve their grade, will be entitled to sit for the the global test, prevailing, in any case, the best of the grades obtained.

The type of the final global test will be similar in the two official calls of the academic year and the date will be established by the center in the academic calendar.

The overall final test will consist of two different activities:

1. Short-answer or multiple-choice written test. (A1) It will consist of theoretical-practical questions of short development or multiple-choice questions. This activity will be evaluated from 0 to 10 points and will constitute 48% of the final grade of the subject. It is necessary to obtain at least a 3.5 out of 10 in this activity to pass the subject.
2. Written test of problems. (A2) It will consist of the development of several problems related to the contents of the subject. This activity will be evaluated from 0 to 10 points and will constitute 52% of the final grade of the subject. A minimum grade of 4.0 out of 10 is required in this activity to pass the subject.

Alignment with the SDGs

Assessment activity 2 of the global test, consisting of the development of problems, includes content related to SDG 9, as well as the continuous assessment activities, if applicable.

Assessment criteria

- The concision and accuracy of the answers.
- The correct use of units in magnitudes.
- The approach to problem solving.
- The accuracy of the numerical results, as well as the order, presentation and interpretation of the results.
- Clarity in diagrams, figures and graphic representations.
- Spelling mistakes

Calculation of the final grade:

The final grade (CF) out of 10 points, will be obtained by applying the following equation:

$$CF = [0.48 \times \text{Note A1}] + [0.52 \times \text{Note A2}]$$

In order to pass ($CF \geq 5.0$) it is essential that: $[\text{grade A1} \geq 3.5]$ and $[\text{grade A2} \geq 4.0]$

In the event that the above requirements are not met, the final grade will be obtained as follows:

- If $CF \geq 4$, the final grade will be: Fail (4.0)
- If $CF < 4$, the final grade will be: Fail (CF)

The grade of the A1 and A2 activities in the first call will not be saved for the second call.

Success rates in previous years

The success rates for the last three years have been: 2019/20: 100%; 2020/21: 100%; 2021/22: 100%