

60566 - Rural facilities and roads

Syllabus Information

Academic year: 2023/24

Subject: 60566 - Rural facilities and roads

Faculty / School: 201 - Escuela Politécnica Superior

Degree: 546 - Master in Agricultural Engineering

ECTS: 6.0

Year: 1

Semester: Second semester

Subject type: Compulsory

Module:

1. General information

The main objective of the subject is that the student acquires the knowledge and technical skills that will allow them to perform the sizing and calculation of some of the following rural facilities: small reservoirs for agricultural use, rural roads, transformer stations and LV distribution networks.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>), contributing to some extent to their achievement: Goal 6: Clean Water and Sanitation; Goal 7: Affordable and Clean Energy; Goal 9: Build Resilient Infrastructure, Promote Inclusive and Sustainable Industrialization and Foster Innovation.

2. Learning results

1. To describe and technically justify the elements that constitute a small reservoir.
2. To determine the stability of a compacted soil slope.
3. To describe and technically justify the elements that constitute a rural road.
4. To technically justify the components of a HV/LV transformer substation.
5. To technically justify a LV overhead distribution network.
6. To technically justify a subway LV distribution network.

... ensuring that these infrastructures are reliable, sustainable, resilient and of high quality; promoting the adoption of clean and environmentally sound technologies and industrial processes; and using resources more efficiently, in line with the SDGs of the 2030 Agenda referred to in section 1.1 (SDGs 6, 7 and 9).

3. Syllabus

1. Transformation centres [SDG 7 and 9].
2. Low voltage distribution networks [SDG 7 and 9].
3. Slope stability in earthworks.
4. Indoor power and lighting electrical distributions [SDG 7 and 9].
5. Concrete tanks [SDG 6].
6. Reservoirs for agricultural use: ponds [SDG 6].
7. Reservoirs for agricultural use: dams [SDG 6].
8. Rural roads.

4. Academic activities

Master classes: 30 h

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

Problems and cases: 22 h

Calculation of HV/LV transformer stations, technical justification of LV distribution networks, slope stability in earthworks, case study of a rural road.

Special practices in installations: 8h

Personal study: 87 h

Assessment tests: 3 h

5. Assessment system

The assessment system of the subject will be a global final test.

The overall final exam will be similar in the two official calls of the academic year and the date will be established by the centre in the academic calendar.

The overall final test will consist of three different assessment activities:

- **Activity 1 (A1):** Short-answer or multiple-choice written test on block 1 of the subject (topics 1 to 3). This activity will be graded from 0 to 10 points and will constitute 30% of the final grade for block 1. A minimum grade of 4.0 out of 10 is required in this activity to pass the subject. The test will be conducted without any supporting documentation.
- **Activity 2 (A2):** Written test of development of problems on block 1 of the subject (topics 1 to 3). This activity will be graded from 0 to 10 points and will constitute 70% of the final grade for block 1. A minimum grade of 4.0 out of 10 is required in this activity to pass the subject. The test may be taken with supporting documentation (notes, books, etc.). Computers, cell phones and internet access are not allowed.
- **Activity 3 (A3):** Production and defence of an individual work on block 2 of the subject (topics 4 to 8). The topic will be mutually agreed between the student and the teacher. This activity will be graded from 0 to 10 points and will correspond to the final grade of block 2. A minimum grade of 4.0 out of 10 is required in this activity to pass the subject.

Alignment with the SDGs

The problems (A2) and individual work (A3) include content strongly aligned with SDGs 7 and 9, and -secondarily- with SDG 6.

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:

$$CF = [(0.30 \times \text{Grade A1} + 0.70 \times \text{Grade A2}) \times 0.4] + [\text{Grade A3} \times 0.6] + [\text{Grade A3} \times 0.6].$$

In order to pass ($CF \geq 5.0$) it is essential that: $[\text{grade A1} \geq 4.0]$ and $[\text{grade A2} \geq 4.0]$ and $[\text{grade A3} \geq 4.0]$.

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: "Failed" (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

| 2019/2020 | 2020/2021 | 2021/2022 |
|-----------|-----------|-----------|
| 100% | 100% | 100% |