

28764 - Construction of Transport Infrastructures: Paths and Roads

Syllabus Information

Academic Year: 2019/20

Subject: 28764 - Construction of Transport Infrastructures: Paths and Roads

Faculty / School: 175 -

Degree: 423 - Bachelor's Degree in Civil Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject Type: Optional

Module: ---

1.General information

1.1.Aims of the course

The subject and its expected results respond to the following approaches and objectives:

The specific objectives of the subject are:

Roads are the most important element of transport in Spain and in the world. In addition to the need to transport people and goods, there is also the need for traffic to be carried out under sufficiently safe conditions.

The development of transport infrastructures is fundamental for the economic development of countries and for the standard of living in towns and cities.

The design of roads is constituted by multiple concepts and regulations specific to them and which must be known for the professional development of a Civil Engineer. Almost all projects and works related to Civil Engineering have a path or a road in one of its phases.

This course provides the necessary knowledge for the design and construction of roads.

1.2.Context and importance of this course in the degree

The subject Construction of Transport Infrastructures: Paths & Roads is part of the Degree in Civil Engineering taught by EUPLA, and is part of the group of subjects that make up the module called Specific Training. This is an optional fourth-year course in the first semester, with a teaching load of 6 ECTS credits.

This subject corresponds to a specific speciality of the profession of Civil Engineer suitable for the professional development of the graduate.

1.3.Recommendations to take this course

There are no prerequisites to take this course. However, the contents to be studied will require the skills and abilities acquired in the following subjects, mainly.

- **Graphic Expression:** The graphic resources are necessary to represent the technical solutions associated with the subject. CAD programs will be used.
- **Geology:** The definition of roads requires a basic knowledge of geology.
- **Geotechnics:** The definition of roads requires to know the basic concepts of geotechnics.
- **Fundamentals of Hydraulic Engineering:** The hydraulic concepts are necessary for the development of part of the subject.
- **Topography:** Roads must be reflected in the real terrain, for this, the student should handle the topographic tools.
- **Mathematics:** Problem solving requires the application of equations, hypotheses and calculation strategies acquired in these subjects.

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The learning process designed for this subject is based on the following:

Strong interaction between the teacher/student. This interaction is brought 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 Construcción de infraestructuras de transporte: caminos (Construction of transport infrastructures: Roads) 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 real-world projects, 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.
- **Project Development Support Classes:** The lecture group is divided up into various groups, according to the number of registered students, but never with more than 20 students, in order to make up smaller sized groups. The students will develop real-world projects using the concepts learned in the theory and practical classes
- **Individual Tutorials:** Those carried out giving individual, personalized attention with a teacher from the department. Tutorials may be in person or online.

4.2.Learning tasks

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.
- **Project Development Support Classes:** This work is tutored by a teacher, in groups of no more than 20 students.
- **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 real-world projects.
- 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, taking into account the level of experimentation considered for the said subject is moderate.

Activity	Weekly school hours
Lectures	3
supervised practice sessions	1
Other Activities	6

Nevertheless the previous table can be shown into greater detail, taking into account the following overall distribution:

- 40 hours of lectures, with 50% theoretical demonstration and 50% solving type problems.
- 10 hours of Project Development Support Classes (supervised practice sessions), in 1 or 2 hour sessions.
- 6 hours of written assessment tests, one hour per test.
- 4 hours of PPT presentations.
- 90 hours of personal study, divided up over the 15 weeks of the 2nd semester.

There is a tutorial calendar timetable set by the teacher that can be requested by the students who want a tutorial.

4.3.Syllabus

Lesson 1. Road network characteristics.

Lesson 2. Geometrical road design.

Lesson 3. Infrastructure.

Lesson 4. Road surface and pavements.

Lesson 5. Road equipment

Lesson 6. Traffic control, regulation and planning.

Lesson 7. Road safety.

Lesson 8. Rehabilitation of road and bridges.

4.4.Course planning and calendar

The list below shows the contents of each week. They are consistent with the lessons of the subject (The order could be modified in case of changes in the university calendar)

Week 1: Lesson 1. Road network characteristics.

Week 2: Lesson 2. Geometrical road design.

Week 3: Lesson 2. Geometrical road design.

Week 4: Lesson 2. Geometrical road design.

Week 5: Lesson 2. Geometrical road design.

Week 6: Lesson 3. Infrastructure.

Week 7: Lesson 3. Infrastructure.

Week 8: Lesson 3. Infrastructure.

Week 9: Lesson 4. Road surface and pavements.

Week 10: Lesson 4. Road surface and pavements.

Week 11: Lesson 5. Road equipment

Week 12: Lesson 5. Road equipment

Week 13: Lesson 6. Traffic control, regulation and planning.

Week 14: Lesson 7. Road safety.

Week 15: Lesson 8. Rehabilitation of road and bridges.

The dates of the final exams will be those that are officially published at

<http://eupla.unizar.es/asuntos-academicos/examenes>

4.5. Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=28764&year=2019