

## 28746 - Construction of Transport Infrastructures: Paths

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 28746 - Construction of Transport Infrastructures: Paths

**Faculty / School:** 175 - Escuela Universitaria Politécnica de La Almunia

**Degree:** 423 - Bachelor's Degree in Civil Engineering

**ECTS:** 6.0

**Year:** 4

**Semester:** First semester

**Subject type:** Compulsory

**Module:**

### 1. General information

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

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

The design of roads is made up of a plethora of concepts and regulations that are specific to them and that should be known for the professional development of a Civil Engineer. Virtually all projects and works related to Civil Engineering have a road or highway in one of their phases.

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

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (<https://www.un.org/sustainabledevelopment/es/>), specifically 9.1 of Goal 9 and targets 11.2, 11.3 of Goal 11.

### 2. Learning results

To fully understand the legislation and regulations applicable to road projects and works of all types, their essential parts and design criteria.

Handling the most common road layout programs

Carrying out a road project

Design of road accessory elements: drainage, signage, etc.

### 3. Syllabus

Unit 1. Basic characteristics of the road system.

Basic road vocabulary. Regulations. Types of roads. Protection of roads.

Traffic studies. Main traffic variables. Uses of traffic studies. Capacity of a road.

Unit 2. Geometric design. Layout.

Basic concepts. Parameters affecting the design. Speed, stopping distance, overtaking distance, decision crossing distance. Axis. Plan layout. Elevation drawing. Plan - elevation compatibility.

Unit 3. Infrastructure.

- Surface drainage

Basin and sub-basin. Time of concentration. Return period. Methodology for calculating the elements of drainage. Need for road drainage. Longitudinal drainage. Transverse drainage. River floods and their effects on bridges.

- Subway drainage

Basic concepts. Frost. Subway drainage elements.

- Geology and geotechnics

Geology and geotechnics in roads. Conducting research. Documents in the project. Structure of the studies. Types of tests.

- Construction of esplanades

Bearing capacity of the esplanade. Parts of the esplanade. Materials. Types of esplanades. Effect of traffic. Application to construction sites. Tests and verification of the installation on site. Construction phases. Machinery.

Unit 4. Pavements and pavements.

Types of pavements. Fundamental characteristics of pavements and their constituent elements. Materials. Design and construction. Flexible firmness. Rigid pavements. Mixed pavements and others.

Unit 5. Road safety.

Basic concepts of road safety. Road safety audits.

#### 4. Academic activities

- Generic face-to-face activities:

- Theoretical classes: Exposition, Explanation of theoretical concepts of the subject, supported with examples and problems.
- Practical classes: Proposal of problems and case studies.

- Generic non face-to-face activities:

- Study and assimilation of the theory presented in the lectures.
- Understanding and assimilation of problems and case studies solved in practical classes.
- Problem solving
- To carry out a layout project; to prepare a public presentation using audiovisual media.
- Preparation for final exams.

#### 5. Assessment system

##### Continuous assessment system

- **Individual activities in class:** This activity will be materialized in the presentation, exposition and discussion of a layout project, in class and directed to their classmates. Minimum score 5 out of 10.

- **Exercises, theoretical questions and proposed works:** The professor will propose exercises, problems, practical cases, theoretical questions, etc. to be solved individually. The main element will be the layout project divided into three parts : traffic study, drainage and layout. Also included in this section is attendance to class visits by professionals of recognized prestige in the sector or visits to construction sites and other activities.

**Written assessment tests:** Written exams scored from 0 to 10 points. The final grade will be the average arithmetic mean of these tests, provided that there is no unit grade below 3 points.

Assessment activity	Weighting
Individual classroom activities	10 %
Individual practices.	30 %
Written assessment tests:	60 %

Prior to the first official exam, the teacher will notify each student whether or not they have passed the subject in the first exam of the continuous evaluation system.

##### Final assessment system:

- **Project:** The student will deliver a layout project divided into three parts: traffic study, drainage and layout at beginning of the global evaluation test, as a sine qua non condition to pass the subject. A minimum of 5 out of 10 is required.

- **Written exam** It will consist of a test containing questions and problems related to the topics explained throughout the subject. This test will be graded from 0 to 10 points.

Assessment activity	Weighting
Projects	30 %
Written exam	70 %

For those students who have failed the continuous assessment system, but have passed the assignments, they will only have to take the written exam of the global assessment system.