

## 28611 - Topography and Layout

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 28611 - Topography and Layout

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

**Degree:** 422 - Bachelor's Degree in Building Engineering

**ECTS:** 6.0

**Year:** 2

**Semester:** First semester

**Subject type:** Compulsory

**Module:**

### 1. General information

The main goal of this subject is that the student learns the basic concepts and methodologies of topographic work, both at a theoretical and experimental level, always taking into account the real practical application to surveying and topographic stakeout situations and the use of topographic devices of all types.

### 2. Learning results

- Knowledge and analytical skills for the application of surveying methods.
- Ability to elaborate and interpret the graphic documentation of a project, referring to the topography of the terrain.
- Ability to work with the different types of surveying instruments currently used in civil engineering
- Aptitude to carry out the graphic survey of the terrain, as well as for the staking out on the same of projects of civil works
- Ability to control the work units that define the execution of a civil work.

### 3. Syllabus

Unit 1: Graphic expression and Topography

1.1 Main objectives of Topography: Surveying, stakeout and measurements

1.2 Graphical representation

1.3 Units, measurements and errors.

Unit 2: Basic principles of Geodesy.

2.1 Introduction.

2.2 Geometry of the ellipsoid and the geoid.

2.3 Reference systems and coordinates

2.4 Geodetic networks.

2.5 UTM projection

Unit 3: Planimetry and Theodolite (Total Station)

3.1 Angle Measuring Devices → TEODOLITO

3.2 Distance measuring devices → DISTANCE METER

3.3 Radiation

3.4 Polygonation

Unit 4: Altimetry and Level.

4.1 Apparatus for measuring unevenness, the LEVEL.

4.2 Geometric Leveling → Horizontal Visuals → LEVEL

Simple Leveling Methods (Two Point, One Station)

Composite Leveling Methods (Two points, more than one station)

Altimetric itineraries

### 4.3 Trigonometric Leveling. → Visual inclined → TACHOMETER

Unit 5: Surveying and Topographic GPS.

#### 4. Academic activities

Master classes: 13 days - 26 hours

Theoretical master classes 12hours

Lectures-problems and practicals 14 hours

Field Practices: 9 days - 18 hours

Practice 1: Sketch - 1 day, 2 hours .

Practice 2: Parking and readings - Sketches - 1 day, 2 hours.

Practice 3: Radiation - 1 day, 2 hours.

Practice 4: Planimetric Itinerary - 2 days, 4 hours.

Practice 5: Leveling - 1 day, 2 hours.

Practice 6: Final Practice, topographic survey - 3 days, 6 hours.

Personal work in the elaboration of practices and problems 16 hours

Problems: 7 hours

Preparation of practices reports: 9 hours

Assessment Tests: 6 hours.

#### 5. Assessment system

The subject will be assessment through two possible modalities to be chosen by the student by means of the following activities.

##### Modality 1. Continuous Assessment.

Theoretical test (50% of the grade).

Midterm exam 1 - (25% of the grade). Units 1 and 2

Midterm exam 2 - (25% of the grade). Units 3, 4 and 5.

Internships (50% of the grade)

Practical Report 1, 2, 3, 4 and 5 (20% of the Grade)

Final Practical Report - (25% of the grade).

Practical Reports of talks and technical visits (5% of the grade).

This modality implies MANDATORY attendance to all practices.

Maximum of two DULY EXCUSED absences

Theory and practical parts are independent, if one of them is passed it is kept during the term.

A minimum of 3 must be obtained in each of the two parts, as well as in each of the two test.

##### Modality 2. Non-Continuous Assessment.

Theoretical final test(50% of the grade)

Final practical test (50% of the grade).

Theory and practical parts are independent, if one of them is passed it is kept during the term.

A minimum of 3 must be obtained in each of the two parts.

#### 6. Sustainable Development Goals

5 - Gender Equality

6 - Clean Water and Sanitation

7 - Affordable and Clean Energy