

### COURSE NAME

Name: **HYDRAULIC AND ENVIROMENTAL SYSTEMS**

Code: 101154

Curriculum: **DEGREE IN CIVIL ENGINEERING**

Year: 4

Name of the module to which it belongs: HYDROLOGY SPECIFIC TECHNOLOGY MODULE

Subject: SANITARY ENGINEERING

Nature: OBRIGATORY Duration: FIRST SEMESTER

ECTS Credits: 9

Classroom hours: 90

Face-to-face classroom percentage: 40%

Non-contact hours: 135

### FACULTY DETAILS

Name: GARCÍA MORILLO, JORGE (Coordinator)

Department: AGRONOMY

Area: HYDRAULIC ENGINEERING

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Name: LINARES TORRALBO, JAIME

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Name: RUIZ AGUILAR, PEDRO ÁNGEL

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### SKILLS

CB1	Have and understand specific knowledge of the field of study of mining engineering.
CB2	Have and understand current and cutting-edge knowledge of the field of mining engineering.
CB3	Be able to apply the knowledge acquired in professional contexts and to elaborate and defend arguments in the field of knowledge of mining engineering.
CB4	Solve problems within the study area of Mining Engineering.
CB7	Possess the learning skills necessary to undertake studies with a high degree of autonomy.
CU2	Know and refine the user level of ITs.
CU3	Promote active job search habits and entrepreneurship skills.
CEH2	Knowledge and understanding of ecosystem functions and environmental factors.
CEH3	Knowledge of urban services projects related to water distribution and sanitation
CEH4	Knowledge and understanding of supply and sanitation systems, as well as their dimensioning, construction and maintenance.

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### OBJECTIVES

1. Knowledge and understanding of urban supply and sanitation systems.
2. Criteria for design, dimensioning and analysing urban supply and sanitation systems.

### CONTENTS:

#### 1. Theoretical contents

##### I. SUPPLY NETWORKS.

- 1 - Introduction to drinking water supply
- 2 - General approach to pipeline design
- 3 - Presence of air in the pipes. Valves
- 4 - Study of hydraulic transients: Water hammer
- 5 - Mechanically calculating pipes.
- 6 - Analysing and designing pressurised water supply networks.

##### II. SANITATION AND SEWERAGE.

- 1 - Introduction to urban sanitation. Urban hydrology.
- 2 - Designer flow rates. Urban wastewater and rainwater flow.
- 3 - Elements that make up the urban drainage network.
- 4 - Calculating and designing sanitation and urban drainage networks.

##### III. IRRIGATION SYSTEMS.

- 1 - Estimating the theoretical water needs of plants.
- 2 - Typology of irrigation networks.
- 3 - Surface, sprinkler and drip irrigation.
- 4 - Irrigation in urban green areas.

#### 2. Practical contents.

##### I.

- EXERCISES/PROBLEMS FOCUSED ON IMPLEMENTING A PRACTICAL CASE STUDY.
- COMPUTER TOOLS FOR ANALYSING AND DESIGNING PRESSURISED WATER NETWORKS.
- ACADEMIC ACTIVITY. GROUP WORK/PROJECT FOR DESIGNING AND CALCULATING A SUPPLY NETWORK.

##### II.

- EXERCISES/PROBLEMS FOCUSED ON CARRYING OUT A PRACTICAL CASE STUDY.
- COMPUTER TOOLS FOR ANALYSING AND DESIGNING SANITATION NETWORKS. APPLYING THIS TO A REAL CASE.
- ACADEMIC ACTIVITY. GROUP WORK/PROJECT FOR DESIGNING AND CALCULATING A SANITATION NETWORK.

##### III.

- CALCULATING THE THEORETICAL WATER REQUIREMENTS OF PLANTS AND GREEN AREAS.
- COMPUTER TOOLS FOR CALCULATING WATER REQUIREMENTS IN GREEN AREAS. ORAL PRESENTATION OF THE WORK CARRIED OUT DURING THE COURSE.