

## SUBJECT TEACHING GUIDE

G1151 - Water Supply and Wastewater Systems (Construction)

Degree in Civil Engineering

Academic year 2021-2022

1. IDENTIFYING DATA					
Degree	Degree in Civil Engineering			Type and Year	Optional. Year 4
Faculty	School of civil Engineering				
Discipline	Subject Area: Water Engineering Technology (Construction)				
Course unit title and code	G1151 - Water Supply and Wastewater Systems (Construction)				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web	<a href="http://moodle.unican.es/moodle2/course/view.php?id=907">http://moodle.unican.es/moodle2/course/view.php?id=907</a>				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS Y TECNICAS DEL AGUA Y DEL MEDIO AMBIENTE				
Name of lecturer	AMAYA LOBO GARCIA DE CORTAZAR				
E-mail	amaya.lobo@unican.es				
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 2. DESPACHO - Area de Tecnologías del Medio Ambiente (2033)				
Other lecturers					

3.1 LEARNING OUTCOMES
- Understand and terminologically interpret the enunciation of environmental problems .
- Understand and interpret a water quality analysis and evaluate it in light of the legislation.
- Estimate the water demand of a population and the design flows of different works.
- Estimate the waste production of a population, the means of transport and its treatment.
- Estimate the flow rate and contamination of a wastewater discharge.
- Evaluate the effect on a river of a wastewater discharge.
- Know the operation of a Wastewater Treatment Plant and a Water Treatment Plant.
- Design and size any element of the supply and sanitation systems of a population.

#### 4. OBJECTIVES

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The student must be able to:

Master the concepts of environmental engineering (origin: sanitary engineering, environmental management, demography, public health, toxicology, risk prevention, waste management, contaminated soil, air pollution, noise).

Know the concepts of water quality and pollution, Wastewater, Receiving media, Management and control of water quality, Legislation.

Know the operation of a Water Treatment Plant and a Wastewater Treatment Plant

Know the operation of the urban water cycle.

Calculate the demand and consumption of water in a population.

Design and calculate any element of a supply and sanitation system of a population.

#### 6. COURSE ORGANIZATION

##### CONTENTS

1	<p>Bases of Environmental Engineering. Introduction to Sanitary and Environmental Engineering Environmental management. Demography. Public health. Toxicology. Risks prevention. Introduction to the Management of Waste and Contaminated Soils. Air and noise pollution.</p> <p>(From week 1 to week 4)</p>
2	<p>Water cycle in the urban environment. Demands and consumption. Data for the design. Water catchment. Water pipelines: Types, materials and elements. Design software. Pressure pipelines. Pump technology. Pumping stations.</p> <p>(From week 4 to week 7)</p>
3	<p>Introduction to Water Quality and Water Pollution Introduction to Drinking Water Treatment Introduction to Wastewater Treatment</p> <p>(From week 12 to week 15)</p>
4	<p>Deposits. Flow meters and measurement of other parameters. Water distribution networks. Elements. Design software. Wastewater networks. Elements. Design software. Quality and pollution in networks. Regulations. Tests. Conservation and exploitation.</p> <p>(From week 7 to week 12)</p>
5	<p>Visits and computer room.</p> <p>(From week 10 to week 15)</p>

## 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Section 1 Exam	Written exam	No	Yes	20,00
Section 2 Exam	Written exam	No	Yes	20,00
Section 3 Exam.	Written exam	No	Yes	20,00
Section 4 Exam	Written exam	Yes	Yes	30,00
Laboratory and visits reports.	Laboratory evaluation	No	No	10,00
<b>TOTAL</b>				<b>100,00</b>

### Observations

In relation to the resolutions adopted at the regular session of the School Board held on June 10, 2010, it is established that, with respect to evaluation activities that have the character of recoverable:

- As a general criterion and unless otherwise specified in this guide, a student may only apply to the recovery of those activities that have not passed, that is, in those that have not obtained a qualification minimum of five out of ten.
- As a general criterion and unless otherwise specified in this guide, in the recovery period the procedure of evaluation of an activity will be the same as that of the activity that originates it.

Note: According to the royal decree RD 1125/2003 on the European system of credits and the system of qualifications in the university degrees of an official nature and valid throughout the national territory, the results obtained by the student in each of the subjects of the curriculum will be graded according to the following numerical scale from 0 to 10, with expression of a decimal, to which the corresponding qualitative qualification may be added:

0.0-4.9: Suspenso (SS). 5.0-6.9: Aprobado (AP). 7.0-8.9: Notable (NT). 9.0-10: Sobresaliente (SB).

The grades obtained in each section are preserved until the extraordinary exam of September.

### Observations for part-time students

In order to facilitate the evaluation systems for part-time students, given their situation, the following is proposed:

- \* The possibility of attending partial evaluations if they can do so.
- \* For those partial evaluations that they have not been able to attend, they will be examined at the final exam dates, both in June and September, established by the School's Studies Department.

Regarding the evaluation of the practices, which represent 10% of the final grade, the following is proposed:

- \* For Epanet practices, attendance is considered mandatory, being able to attend on the scheduled dates or reaching an agreement with the professor on other dates.
- \* For the practice of visiting the WWTP, WTP and LANDFILL the attendance is not compulsory, and the student can either attend and present the report, or in agreement with the professor present the report on a specific WTP, WWTP AND LANDFILL.

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

### BASIC

- TEJERO, I.; SUAREZ, J.; JÁCOME, A.; TEMPRANO, J. (2004). "Introducción a la Ingeniería Sanitaria y Ambiental". Vol. 1 y 2. ISBN:84-89627-68-1. E.T.S.I.C.C.P., Universidad Cantabria.
- TEJERO; SUAREZ; TEMPRANO; JÁCOME; GARCÍA. (2000). Problemas de Ingeniería Sanitaria y Ambiental. ISBN: 84-607-0983-3. E.T.S.I.C.C.P. Universidad Cantabria. Universidad Coruña.
- MAYS, L.W. (2003) Manual de sistemas de distribución de agua. Mc Graw- Hill.
- PÜRSCHEL., W. (1978). El transporte y la distribución del agua. Ed. Urmo. S.A. Bilbao.
- PÜRSCHEL., W. (1976). La captación y el almacenamiento del agua potable. Ed. Urmo. S.A. Bilbao.
- PÜRSCHEL., W. (1976). Las redes urbanas de saneamiento. Ed. Urmo. S.A. Bilbao.