

## SUBJECT TEACHING GUIDE

### 612 - Hydraulic Engineering

#### Master's Degree in civil Engineering, Canal and Port Engineering

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Master's Degree in civil Engineering, Canal and Port Engineering			Type and Year	Optional. Year 2
Faculty	School of civil Engineering				
Discipline	SPECIALITY IN WATER, ENERGY AND THE ENVIRONMENT				
Course unit title and code	612 - Hydraulic Engineering				
Number of ECTS credits allocated	3	Term	Semester based (2)		
Web					
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	ANDRES GARCIA GOMEZ				
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Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 0. DESPACHO (0023)				
Other lecturers					

3.1 LEARNING OUTCOMES
- To describe and design diversion dams for water supply.
- To describe and design the main elements of a bottom intake.
- To analyze the hydraulic behavior and design the hydraulic structures needed for channel operation.
- To design erodible channels.
- To design pumping stations.
- To design the water distribution system for a sprinkler or drip irrigation system.
- To determine the type and dimensions of the main elements of a hydroelectric plant.

#### 4. OBJECTIVES

- Know flowing water diversion works and design diversion dams and bottom intakes
- Size/project/exploit hydraulic canals, pressure conduits and pumping stations.
- know and size the main elements of hydropower plants and irrigation systems (sprinkler or localized systems).

#### 6. SUBJECT PROGRAM

##### CONTENTS

1	RIVER DIVERSION. River intake structures. Diversion dams: types, dam design, intake design. Bottom intakes.
2	CHANNEL DESIGN: General aspects. Design of special structures: gates, side weirs, desanders, falls and rapids, flow control structures. Erodible channel design.
3	PRESSURE PIPELINES AND PUMPING STATIONS. General aspects. Air release. Water hammer protection. Design of pumping stations.
4	HYDRAULIC APPLICATIONS. Hydroelectric plants: conveyance channel and forebay, pressure tunnel, surge tank, penstock. Irrigation systems: sprinkler and drip systems, hydraulic design of laterals and mainlines.

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Final exam	Written exam	Yes	Yes	40,00
Course work	Work	No	Yes	50,00
Classroom activities	Activity evaluation with Virtual Media	No	No	10,00
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
<p>As accorded by the relevant committees, as a general rule, and unless stated otherwise anywhere in this guide:</p> <ul style="list-style-type: none"> <li>- A student cannot request a reexamination if the original grade obtained in the evaluation was not a fail .</li> <li>- The reexamination activity will take the same form than the original evaluation activity.</li> </ul> <p>Grades are measured on a numeric scale going from 0 to 10, where values smaller than 5 are a Fail.</p> <p>Marks obtained in the course evaluation activities will be kept until the re-sit examination period.</p> <p>Only for duly justified reasons (eg sanitary restrictions) the evaluation tests may be organized remotely, with prior authorization from the Center's Administration.</p>				
<b>Observations for part-time students</b>				
Part-time students will need to assist to the final exam of the subject and complete the course work activities.				

#### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

- BASIC**
- Chow, V.T. (1982). Hidráulica de los canales abiertos. Editorial Diana.
  - Cuesta, L. y Vallarino, E. (2000). Aprovechamientos Hidroeléctricos. Ed. Colegio de Ingenieros de Caminos, Canales y Puertos. Colección Senior. Madrid.
  - Escribá, D. (1988). Hidráulica para ingenieros. Editorial Bellisco.
  - Grupo Mecánica de Fluidos (1999). Análisis de sistemas hidráulicos aplicados al riego. Universidad Politécnica de Valencia.
  - Martínez Marín, E. (trad). (2007). Diseño de pequeñas presas. Bureau of Reclamation. USA.

