

## SUBJECT TEACHING GUIDE

G1163 - Hydraulics Applications

Degree in Civil Engineering

Academic year 2022-2023

1. IDENTIFYING DATA					
Degree	Degree in Civil Engineering			Type and Year	Optional. Year 4
Faculty	School of civil Engineering				
Discipline	Subject Area: Hydraulic Engineering				
Course unit title and code	G1163 - Hydraulics Applications				
Number of ECTS credits allocated	6	Term	Semester based (1)		
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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Other lecturers	CESAR ALVAREZ DIAZ

### 3.1 LEARNING OUTCOMES

- To know the constituent elements of each one of the different types of hydropower plants.
- To analyze comparatively the functional characteristics of each type of hydropower plant.
- To calculate the power and hydroelectric production of different hydropower plants , according to their characteristics and exploitation regime.
- To select the most appropriate machinery to a specific hydropower plant , determining their basic size and the elevation of the turbine above the tailwater.
- To know the qualitative aspects of the processes involved in the relationship water -soil-plant, determining the crop water needs.
- To organize the irrigation schedule adjusting the amount of water and the irrigation schedule
- To know the main techniques of irrigation and drainage.
- To design the main irrigation and drainage systems.

### 4. OBJECTIVES

The student will acquire sufficient skills to start developing its work in the field of hydraulic engineering in the different stages of design, construction and operation, with some specialization in areas related to hydroelectric power generation and irrigation.

### 6. COURSE ORGANIZATION

CONTENTS	
1	Water needs of crops.
2	Irrigation scheduling.
3	Surface irrigation.
4	Sprinkler irrigation.
5	Drip irrigation.
6	Agricultural drainage.
7	General characteristics of the electricity market.
8	Basic concepts of hydropower plants.
9	Run-of-river hydropower plants.
10	Storage hydropower plants.
11	Pumped storage hydropower plants.

## 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Irrigation systems exam	Written exam	No	Yes	25,00
Hydropower systems exam	Written exam	Yes	Yes	25,00
Irrigation systems practical exercises	Others	No	Yes	25,00
Hydropower systems practical exercises	Others	No	Yes	25,00
TOTAL				100,00
Observations				
<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> <li>- Grades are measured on a numeric scale going from 0 to 10, where values smaller than 5 are a Fail.</li> </ul> <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>				
Observations for part-time students				
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

Cuesta, L. y Vallarino, E. (2000). Aprovechamientos Hidroeléctricos. Ed. Colegio de Ingenieros de Caminos, Canales y Puertos. Colección Senior. Madrid.

Liria Montañés, J. y Sainz Borda, J.A. (1983). Complementos de Aprovechamientos Hidroeléctricos. Ed. Servicio de Publicaciones. E.T.S. Ingenieros de Caminos, Canales y Puertos. Santander.

Hernández González, C. (1996). Manual de minicentrales hidroeléctricas. Ed. Cinco Días. Madrid.

Delgado Ramos, F. y Delgado García, J. (2005). Problemas de Obras Hidráulicas. Grupo Editorial Universitario. Granada.

Fuentes Yagüe, J.L. (2003) Técnicas de riego. Ministerio de Agricultura, Pesca y Alimentación. Ediciones Mundi-Prensa. Madrid.

Grupo Mecánica de Fluidos (1999). Análisis de sistemas hidráulicos aplicados al riego. Universidad Politécnica de Valencia.

Poirée, M. y Ollier, Ch. (1986). Saneamiento agrícola. Editores Técnicos Asociados, S.A. Barcelona.