

## SUBJECT TEACHING GUIDE

### G1141 - HYDRAULIC WORKS

#### Degree in Civil Engineering

Academic year 2021-2022

1. IDENTIFYING DATA				
Degree	Degree in Civil Engineering		Type and Year	Compulsory. Year 3
Faculty	School of civil Engineering			
Discipline	Subject Area: Hydraulic Works Module: Training in Technology Complements			
Course unit title and code	G1141 - HYDRAULIC WORKS			
Number of ECTS credits allocated	6	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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Other lecturers	

### 3.1 LEARNING OUTCOMES

- To know the different types of dams, depending on the materials used on its construction.
- To identify the key actions on a gravity concrete dam analyzing their influence on its stability.
- To identify the different elements that make up overflow structures , intake structures and bottom outlets, analyzing their hydraulic behavior.
- To know the different types of groundwater supply structures , understanding their hydraulic behavior, determining their basic dimensions or evaluating the extracted flow.
- To analyze the hydraulic behavior of longitudinal drains under the bottom of a lined channel.
- To analyze the hydraulic behavior of major hydraulic structures that are commonly used along a channel.
- To know the main characteristics of pipe materials that are commonly used in civil engineering applications to design and build pipeline systems, and the types of connections used between them.
- To determine the forces that occur on the elbows and branches of a pressure pipeline , due to changes in flow direction and flow distribution.
- To know the different valves that are typically used in a pipeline system , understanding their functional characteristics and determining its impact on the hydraulic behavior of the pipeline.
- To identify the different constituent elements of pump and turbine stations understanding the hydraulic functionality of each one.
- To determine the flow discharged by one or more pumps connected in series or in parallel, in a given hydraulic system.
- To select the type and characteristics of the pump to place in a particular installation , for given flow requirements and lifting head avoiding cavitation problems.
- To know the specific constructive aspects of the different types of hydraulic works (dams, wells, channels, pipelines, pumping stations).

### 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, taking into account properly environmental conditions, in a context in which increasingly it is more necessary the collaboration with professionals from other disciplines.

### 6. COURSE ORGANIZATION

CONTENTS	
1	Storage dams for water supply.
2	Groundwater supply structures.
3	Hydraulic channels.
4	Pipeline systems.
5	Hydraulic machinery.

## 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Course work (midterm exam contents)	Others	No	Yes	15,00
Midterm exam	Written exam	No	Yes	30,00
Course work (final exam contents)	Others	No	Yes	15,00
Final exam	Written exam	Yes	Yes	40,00
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

- Vallarino, E. (2006). Tratado básico de presas (tomos I y II). Ed. Colegio de Ingenieros de Caminos, Canales y Puertos. Colección Senior.
- Martínez Marín, E. (trad). (2007). Diseño de pequeñas presas. Bureau of Reclamation, USA.
- Pimienta, J. (1973). La captación de aguas subterráneas. Editores Técnicos Asociados. Barcelona.
- Michael, A.M. (2008). Water wells and pumps. Ed. McGraw-Hill. Nueva York.
- Liria Montañés, J. (2001). Canales hidráulicos: proyecto, construcción, gestión y modernización. Ed. Colegio de Ingenieros de Caminos, Canales y Puertos. Colección Senior.
- Mayol, J.M. (1983). Tuberías. Tomo I: Materiales, cálculos hidráulicos, cálculos mecánicos. Editores Técnicos Asociados. Barcelona.
- Mateos de Vicente, M. (1990). Válvulas para abastecimiento de agua. Librería Técnica Bellisco. Madrid.
- Mateos de Vicente, M. (2009). Válvulas de retención y otras válvulas afines. Librería Técnica Bellisco. Madrid.
- Karassik, I.J. (1966). Bombas centrífugas: selección, operación y mantenimiento. Ed. Compañía Editorial Continental. México.