

SUBJECT TEACHING GUIDE

M1449 - Hydraulic Engineering

Master's Degree in Civil Engineering

Academic year 2019-2020

1. IDENTIFYING DATA					
Degree	Master's Degree in Civil Engineering			Type and Year	Compulsory. Year 1
Faculty	School of civil Engineering				
Discipline	Project and Management of Water and Hydrological Systems				
Course unit title and code	M1449 - Hydraulic Engineering				
Number of ECTS credits allocated	4,5	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	CESAR ALVAREZ DIAZ

3.1 LEARNING OUTCOMES

- To design diversion structures for water supply.
- To assess the flow pumped from a drilled water well designing the main features of the well casing and screen.
- To know the most relevant aspects regarding to the project of a channel incorporating the constraints imposed by the terrain.
- To know the effect of unsteady flow in the hydraulic design of a channel.
- To carry out the hydraulic design of a channel and the hydraulic structures needed for its appropriate operation.
- To know the most important aspects in the hydraulic design of pipeline systems.
- To know the operation of the main devices for surge protection in pipeline systems.
- To analyze the mechanical behavior of pipes.
- To know the fundamental elements of a hydropower plant determining their most appropriate characteristics.
- To know the main components of a modern irrigation system designing the distribution network and its key elements.
- To know the main techniques used for drainage.
- To know the techniques used in the operation, maintenance and repair of hydraulic works.

4. OBJECTIVES

The students will acquire sufficient competence in the field of hydraulic engineering to start developing their work from the project to the operation, maintenance and repair of hydraulic works.

6. COURSE ORGANIZATION

CONTENTS	
1	Design of water supply works.
2	Channel design.
3	Pipeline system design.
4	Hydraulic applications: hydropower plants, irrigation and drainage.
5	Operation, maintenance and repair of waterworks.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Active participation	Others	No	No	5,00
Course work	Others	No	Yes	25,00
Midterm exam	Written exam	No	Yes	30,00
Classroom exercises	Others	No	No	10,00
Final exam	Written exam	Yes	Yes	30,00
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"> - A student cannot request a reexamination if the original grade obtained in the evaluation was not a fail . - The reexamination activity will take the same form than the original evaluation activity. - Grades are measured on a numeric scale going from 0 to 10, where values smaller than 5 are a Fail. <p>Marks obtained in the course evaluation activities will be kept until the re-sit examination period.</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
Chow, V.T. (1982). Hidráulica de los canales abiertos. Editorial Diana.
Custodio, E., Llamas, M.R. (2001). Hidrología subterránea. Tomo I. Ediciones Omega.
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Escribá, D. (1988). Hidráulica para ingenieros. Editorial Bellisco.
García, C. J. (2011). Conducciones y bombeos. Conceptos teóricos y ejercicios. Librería Técnica Bellisco.
Liria, J. (2001). Canales hidráulicos: proyecto, construcción, gestión y modernización. Ed. Colegio de Ingenieros de Caminos, Canales y Puertos.
Martínez Marín, E. (trad). (2007). Diseño de pequeñas presas. Bureau of Reclamation. USA.
Mayol, J.M. (1981). Tuberías. Tomo I. Materiales. Cálculos hidráulicos. Cálculos mecánicos. Editores Técnicos Asociados, S.A.
Mayol, J.M. (1982). Tuberías. Tomo II. Instalaciones de conducción, distribución y saneamiento. Aplicaciones de cálculo por ordenador. Editores Técnicos Asociados, S.A.
Mayol, J.M. (1993). Tuberías. Tomo III. Economía de las instalaciones, montajes, anexos y tablas. Editorial Bellisco.