

SUBJECT TEACHING GUIDE

603 - HYDROLOGICAL MANAGEMENT

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

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Master's Degree in civil Engineering, Canal and Port Engineering			Type and Year	Compulsory. Year 1
Faculty	School of civil Engineering				
Discipline	HYDROLOGICAL MANAGEMENT				
Course unit title and code	603 - HYDROLOGICAL MANAGEMENT				
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	CESAR ALVAREZ DIAZ				
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Other lecturers	JOSE BARQUIN ORTIZ				

3.1 LEARNING OUTCOMES

- Hydrological management studies data analysis.
- Design and apply hydrological strategies for water systems management.
- Management of water resources in a basin scale, taking into account the conditions imposed by different regulations , by the nature of the demands and by hydraulic, hydromorphological and environmental conditions.
- Use of hydrological management models.
- Solve a problem of sizing and management of a regulation reservoir.
- Analyze the flooding of river basins and its consequences, taking into account the influence of hydraulic, hydromorphological and regulatory aspects.
- Apply existing methodologies for flood risk analysis.
- Design strategies and actions for flood risk mitigation.
- Apply different indicators for the characterization and prognosis of droughts.
- Design strategies and actions for drought risk mitigation.
- Define strategies for groundwater and surface water combined management.

4. OBJECTIVES

- Ability to plan and manage hydraulic resources, including comprehensive management of the water cycle.
- Ability to address the analysis of water risks and design and manage actions for their mitigation.

6. SUBJECT PROGRAM

CONTENTS

1	1. Introduction: The hydrological processes and interactions. The use of water resources. Environmental aspects of water use. Integrated water resources management. Hydro-climatic data: Global and local databases.
2	2. Water resources management: basic concepts. Reservoir management. Instream flow calculation. The control of reservoir silting and solids management. Groundwater management.
3	3. Hydrological risks analysis. Droughts: Introduction to the study of droughts. Types of droughts. Application of indices to estimate drought in a basin. Floods: Flood risk characterization and management. Types of floods. Calculation of hazard, exposure and vulnerability. Damage functions.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Exam 1.	Written exam	No	Yes	20,00
Exam 2.	Written exam	Yes	Yes	20,00
Practical application of hydrological management models.	Work	No	Yes	40,00
Classroom exercises.	Work	No	No	15,00
Class attendance.	Others	No	No	5,00
TOTAL				100,00
Observations				
<p>As accorded by the relevant committess, as a general rule, and unless stated otherwise anywhere in this guide:</p> <ul style="list-style-type: none"> - A studente cannot request 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. <p>Grades are measured on a numerical scale going from 0 to 10, where values smaller than 5 are a Fail. Marks obtained in the course evaluation activities will be kept until the re-sit examination period.</p>				
Observations for part-time students				
<p>Part-time students will need to assist to all the exams of the subject and complete the course work activities. In this case, the percentages corresponding to each activity will be as follows:</p> <ul style="list-style-type: none"> - Exam 2: 20% - Exam 1: 20% - Practical application of hydrological management models: 50% - Classroom exercises: 10%. 				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
Andreu, J. Conceptos y métodos para la planificación hidrológica. Centro Internacional de Métodos Numéricos en Ingeniería. 1993
Balairón Pérez, L. Gestión de recursos hídricos. Ediciones UPC. 2000.
Grigg, N.S. Water resources management. Principles, regulations and cases. McGrau-Hill. 1996
Loucks, D.P.; Stedinger, J.R. Water resources systems planning and management. An introduction to methods, models and applications. UNESCO.2005
Gestión sustentable de aguas subterráneas (GW-MATE). Banco Mundial.2006 http://siteresources.worldbank.org/INTWRD/Resources/GWMATE_Spanish_Publication_List.pdf