SUBJECT TEACHING GUIDE

M2064 - Experimental Methods in Laboratory and Field

Master's Degree in Coasts and Ports

Academic year 2019-2020

1. IDENTIFYING DATA					
Degree	Master's Degree in Coasts and Ports			Type and Year	Compulsory. Year 1
Faculty	School of civil Engineering				
Discipline					
Course unit title and code	M2064 - Experimental Methods in Laboratory and Field				
Number of ECTS credits allocated	1	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS Y TECNICAS DEL AGUA Y DEL MEDIO AMBIENTE
Name of lecturer	CESAR VIDAL PASCUAL
E-mail	cesar.vidal@unican.es
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 0. DESPACHO (0052)
Other lecturers	MARIA EMILIA MAZA FERNANDEZ

3.1 LEARNING OUTCOMES
- Students will learn the advantages and disadvantages of the various experimental methods used in coastal engineering: numerical, physical experimentation in the laboratory and field experiments.
- Students will be able to perform dimensional analysis of the most common processes in coastal engineering and know the most common dimensionless numbers used in the scaling of these processes.
- Students will be able to project physical model tests of flow and stability of artificial or natural structures under the action of waves and currents
- Students will be able to project movable bed and transport of conservative substances physical model tests under the action of waves and currents
- Students will know the measurement techniques used in laboratory physical modeling and field campaigns
- Students will know the techniques and methods of data analysis used in physical modeling and field campaigns

4. OBJECTIVES

The overall objective of the course is that students learn how to design a laboratory test, analyze the results and evaluate their limits of applicability.
The experimental methods are a indispensable complement to theoretical developments and numerical methods for the design and verification of a port or coastal project.
As the other design tools, physical models have their capabilities and limitations, and the accuracy of its results is closely related to the process of design and operation of the test.
In the course the student will be taught to recognize the most relevant parameters of the laboratory model design, to select appropriate scale laws, to raise an effective test and to know the more advanced measurement systems . Finally the student will learn the main methods of analysis of results and of accuracy evaluation.

6. COURSE ORGANIZATION

CONTENTS	
1	General introduction to the investigation method
2	The scientific method and the experimental design. Significance tests and hypothesis controls
3	Introduction to the physical models, scaling laws and pi theorem
4	Fixed and movable experimental tests
5	Methods and measurement techniques
6	Data capture and analysis of results
7	Final exam

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Practice assignement	Work	No	Yes	40,00
Final exam	Written exam	No	Yes	60,00
TOTAL				100,00
Observations				
Observations for part-time students				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Physical Models and Laboratory Techniques in Coastal Engineering
By Steven A Hughes (World Scientific)