UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

<div style="background:green">**1. General information**</div>

Course: PORTS AND COASTS
Type: CORE COURSE
Degree: 2343 - MASTERS DEGREE PROGRAMME IN ENGINEERING OF ROADS, CANALS AND PORTS
Center: 603 - E.T.S. CIVIL ENGINEERS OF CR
Year: 1
Main language: Spanish
Use of additional languages:
Web site:

Code: 310805
ECTS credits: 4.5
Academic year: 2019-20
Group(s): 20
Duration: First semester
Second language: English
English Friendly: Y
Bilingual: N

Lecturer: **Mª DEL CARMEN CASTILLO SANCHEZ** - Group(s): **20**

Building/Office	Department	Phone number	Email	Office hours
A-44	INGENIERÍA CIVIL Y DE LA EDIFICACIÓN	926052560	mariacarmen.castillo@uclm.es	Se fijará al inicio del cuatrimestre/To be set at the beginning of the semester

<div style="background:green">**2. Pre-Requisites**</div>

Not established

<div style="background:green">**3. Justification in the curriculum, relation to other subjects and to the profession**</div>

The subject aims at providing the students with the fundamental knowledge to understand coastal processes and elements

<div style="background:green">**4. Degree competences achieved in this course**</div>

Course competences

Code	Description
CB06	Possess and understand knowledge that provides a basis or opportunity to be original in the development and / or application of ideas, often in a research context.
CB07	Apply the achieved knowledge and ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the area of study
CB08	Be able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of knowledge and judgments
CB09	Know how to communicate the conclusions and their supported knowledge and ultimate reasons to specialized and non-specialized audiences in a clear and unambiguous way
CB10	Have the learning skills which allow to continue studying in a self-directed or autonomous way
G01	Scientific-technical and methodological capacity for the continuous recycling of knowledge and the exercise of the professional functions of consultancy, analysis, design, calculation, project, planning, leadership, management, construction, maintenance, conservation and exploitation in the fields of civil engineering.
G02	Understanding of the multiple technical, legal and property constraints that arise in the design of a public work, and the capacity to establish different valid alternatives, to choose the optimum one and to express it adequately, anticipating the problems of its construction, and using the most suitable methods and technologies, both traditional and innovative, with the aim of achieving the greatest efficiency and promoting the progress and development of a sustainable and respectful society with the environment.
G03	Knowledge, understanding and ability to apply the necessary legislation in the exercise of the profession of Civil Engineer.
G06	Ability to plan, design, inspect and manage land (roads, railways, bridges, tunnels and urban roads) or sea (port works and facilities) transport infrastructures.
G25	Ability to identify, measure, enunciate, analyse, diagnose and scientifically and technically describe a civil engineering problem
G27	Ability to communicate in a second language.
G28	Ability to work in an international context.
G29	Management capacity and teamwork.
TE07	Knowledge and skills to understand the dynamic phenomena involved in the ocean-atmosphere-coast environment and be able to provide answers to littoral, port and coastal problems, including the impact of actions on the coastline. Capacity to carry out studies and projects of maritime works.

<div style="background:green">**5. Objectives or Learning Outcomes**</div>

Course learning outcomes

Description

Students identify and know the actions of the marine dynamics on the seabed, the coastline, maritime works and structures and those of the latter on the marine dynamics.

Students know the regulatory framework and technical recommendations, both national and international.

Students can determine the maritime climate for the design of interventions in the marine environment.

Students know the sources of information and the treatment of the data for the design.

Students are familiar with orders of magnitude and scales in coastal engineering.

Students understand coastal morphodynamics.

Students understand the performance principles of maritime works for their design.

6. Units / Contents

Unit 1: Mathematical, physical and hydrodynamical preliminaries

Unit 2: Water wave theory formulation and solution

Unit 3: Kinematic and dynamic wave properties

Unit 4: Averaged values and energy flux for wave propagation

Unit 5: Wave transformation processes

Unit 6: Short-term and long-term wave analysis

Unit 7: Long waves and water level

Unit 8: Coastal structures

Unit 9: Shoreline processes

Unit 10: Technical documents

Unit 11: Numerical models

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	R	Description
Class Attendance (theory) [ON-SITE]	Lectures	CB06 CB07 CB08 CB09 CB10 G01 G02 G03 G06 G25 G27 G28 TE07	0.66	16.5	N	-	-	
Class Attendance (practical) [ON-SITE]	Combination of methods	CB06 CB07 CB08 CB09 CB10 G01 G02 G03 G06 G25 G27 G28 G29 TE07	0.33	8.25	Y	N	N	Active participation and exercises solved during class hours will be evaluated
Computer room practice [ON-SITE]	Combination of methods	CB06 CB07 CB08 CB09 CB10 G01 G02 G03 G06 G25 G27 G28 G29 TE07	0.08	2	Y	N	N	Working with software
Problem solving and/or case studies [ON-SITE]	Combination of methods	CB06 CB07 CB08 CB09 CB10 G01 G02 G03 G06 G25 G27 G28 G29 TE07	0.28	7	Y	N	N	Active participation and exercises solved during class hours will be evaluated
Writing of reports or projects [OFF-SITE]	Combination of methods	CB06 CB07 CB08 CB09 CB10 G01 G02 G03 G06 G25 G27 G28 G29 TE07	0.43	10.75	Y	Y	Y	Small group work on a case with a final report and an oral exam based on case report (individually graded through group exam)
Study and Exam Preparation [OFF-SITE]	Combination of methods	CB06 CB07 CB08 CB09 CB10 G01 G02 G03 G06 G25 G27 G28 G29 TE07	2	50	N	-	-	Some tools will be available to help students study
On-line Activities [OFF-SITE]	Combination of methods	CB06 CB07 CB08 CB09 CB10 G01 G02 G03 G06 G25 G27 G28 TE07	0.32	8	Y	N	Y	On-line tests
Other off-site activity [OFF-SITE]	Combination of methods	CB06 CB07 CB08 CB09 CB10 G01 G02 G03 G06 G25 G27 G28 G29 TE07	0.4	10	Y	N	N	Students can solve exercises or cases as part of the evaluation
		Total:	**4.5**	**112.5**				
		Total credits of in-class work: 1.35				**Total class time hours: 33.75**		
		Total credits of out of class work: 3.15				**Total hours of out of class work: 78.75**		

As: Assessable training activity

Com: Training activity of compulsory overcoming

R: Rescheduling training activity

8. Evaluation criteria and Grading System

Evaluation System	Grading System		Description
	Face-to-Face	**Self-Study Student**	
Final test	70.00%	0.00%	Written exam 1 (Units 1 through 5/Tema 1 through Tema 5): WE1; Written exam 2 (Units 6 and 7/Tema 6 and Tema 7): WE2; Written exam 3 (Units 8 and 9/Tema 8 and Tema 9): WE3;
Projects	10.00%	0.00%	Group work on a case: GW; Oral exam based on case report (individually graded through group exam)
Assessment of active participation	5.00%	0.00%	Problem or case solving in class hours: CH
Assessment of problem solving and/or case studies	5.00%	0.00%	Problem or case solving outside of class hours: OCH
Assessment of activities done in the computer labs	5.00%	0.00%	Problem or case solving outside of class hours: CS
Test	5.00%	0.00%	On-line test: T
Total:	**100.00%**	**0.00%**	

Evaluation criteria for the final exam:

In order to pass the subject, the following requirements must be satisfied: (at any time: progress tests, final exam o retake exam dates)

a) WE1, WE2, WE3>=5. An exception can be made if WE1 or WE2 or WE3>=4.5 (and the other two>=5) and the global mark>=5;

b) GW>=5;

c) Global mark: $(0.7*(WE1+WE2+WE3)/3+0.1*GW+0.05*(CH+OCH+CS+T))>=5$;

For notation, see the Grading System table (above).

Part of each written exam can be replaced by a problem/case to be solved outside of class hours individually (just applicable for progress tests).

An extra point can be awarded for each written exam. Format is decided throughout the semester.

A compulsory case/problem is to be solved in small groups and a report must be uploaded. After that, an oral group exam is held based on the report where the students are graded individually. Groups of only one member are not allowed.

Any plagiarism will be sanctioned with a 0 in the corresponding global activity. Global activities are described in the Grading System table.

Specifications for the resit/retake exam:
In order to pass the subject, the following requirements must be satisfied: (at any time: progress tests, final exam o retake exam dates)
a) WE1, WE2, WE3>=5. An exception can be made if WE1 or WE2 or WE3>=4.5 (and the other two>=5) and the global mark>=5;
b) GW>=5;
c) Global mark: (0.7*(WE1+WE2+WE3)/3+0.1*GW+0.05*(CH+OCH+CS+T))>=5;

No possibility of replacing part of this exam by a problem/case to be solved outside of class hours individually.

No new extra points for this exam.

Written exams, group work and online tests can be retaken.

Any plagiarism will be sanctioned with a 0 in the corresponding global activity. Global activities are described in the Grading System table.

Specifications for the second resit / retake exam:
A final written exam (FWE) 90%.
In order to pass the subject, the following requirements must be satisfied:
a) FWE>=5;
b) GW>=5 (individual works are not allowed);

Any plagiarism will be sanctioned with a 0 in the corresponding global activity. Global activities are described in the Grading System table.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	**hours**
Writing of reports or projects [AUTÓNOMA][Combination of methods]	10.75
Unit 1 (de 11): Mathematical, physical and hydrodynamical preliminaries	
Activities	**Hours**
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	1
Unit 2 (de 11): Water wave theory formulation and solution	
Activities	**Hours**
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	2
Other off-site activity [AUTÓNOMA][Combination of methods]	.5
Unit 3 (de 11): Kinematic and dynamic wave properties	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	1
Class Attendance (practical) [PRESENCIAL][Combination of methods]	1
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	2
On-line Activities [AUTÓNOMA][Combination of methods]	1
Other off-site activity [AUTÓNOMA][Combination of methods]	1
Unit 4 (de 11): Averaged values and energy flux for wave propagation	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	.5
Class Attendance (practical) [PRESENCIAL][Combination of methods]	.25
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	1
Unit 5 (de 11): Wave transformation processes	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Class Attendance (practical) [PRESENCIAL][Combination of methods]	2
Computer room practice [PRESENCIAL][Combination of methods]	.5
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	2
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	9
On-line Activities [AUTÓNOMA][Combination of methods]	1
Other off-site activity [AUTÓNOMA][Combination of methods]	1.5
Unit 6 (de 11): Short-term and long-term wave analysis	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Class Attendance (practical) [PRESENCIAL][Combination of methods]	2
Computer room practice [PRESENCIAL][Combination of methods]	.5
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	2
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	9
On-line Activities [AUTÓNOMA][Combination of methods]	2

Other off-site activity [AUTÓNOMA][Combination of methods]	1.5

Unit 7 (de 11): Long waves and water level	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Class Attendance (practical) [PRESENCIAL][Combination of methods]	1
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	6
On-line Activities [AUTÓNOMA][Combination of methods]	1
Other off-site activity [AUTÓNOMA][Combination of methods]	1.5

Unit 8 (de 11): Coastal structures	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Class Attendance (practical) [PRESENCIAL][Combination of methods]	2
Computer room practice [PRESENCIAL][Combination of methods]	.5
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	1
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	9
On-line Activities [AUTÓNOMA][Combination of methods]	1.5
Other off-site activity [AUTÓNOMA][Combination of methods]	2

Unit 9 (de 11): Shoreline processes	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Computer room practice [PRESENCIAL][Combination of methods]	.5
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	2
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	7
On-line Activities [AUTÓNOMA][Combination of methods]	1
Other off-site activity [AUTÓNOMA][Combination of methods]	2

Unit 10 (de 11): Technical documents	
Activities	**Hours**
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	2
On-line Activities [AUTÓNOMA][Combination of methods]	.5

Unit 11 (de 11): Numerical models	
Activities	**Hours**
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	2

Global activity	
Activities	**hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	16.5
Class Attendance (practical) [PRESENCIAL][Combination of methods]	8.25
Computer room practice [PRESENCIAL][Combination of methods]	2
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	7
Writing of reports or projects [AUTÓNOMA][Combination of methods]	10.75
Study and Exam Preparation [AUTÓNOMA][Combination of methods]	50
On-line Activities [AUTÓNOMA][Combination of methods]	8
Other off-site activity [AUTÓNOMA][Combination of methods]	10
Total horas:	112.5

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
BRUNN, P.	Port Engineering, Vol 1. Harbor Planning, Breakwaters and Marine Terminals,	Gulf Publishing Company.			1989	
BRUNN, P.	Port Engineering, Vol 2. Harbor Transportation, Fishing Ports, Sediment Transport, Geomorphology, Inlets and Dredging.	Gulf Publishing Company			1989	
Dean, Robert G.	Coastal processes: with engineering applications	Cambridge University Press		0-521-60275-0	2004	
Dean, Robert G.	Water wave mechanics for engineers and scientists	World Scientific		981-02-0421-3	2006	
Dingemans, Maarten W.	Water wave propagation over uneven bottoms	World Scientific Pub.		981-02-0426-4	2000	
Dyke, P. P. G.	Modeling coastal and offshore processes	Imperial College Press		978-1-86094-675-2	2007	
Fredsoe, Jorgen	Mechanics of coastal sediment transport	World Scientific		981-02-0841-3	2005	
Hudspeth, Robert T.	Waves and wave forces on coastal and ocean structures	World Scientific		981-238-612-2	2006	
Hughes, Steven A.	Physical models and laboratory techniques in coastal enginee	World Scientific		981-02-1540-1	1995	
Kamphuis, J. William	Introduction to coastal engineering and management	World Scientific		981-02-4417-7	2002	
Kim, Cheung Hun	Nonlinear waves and offshore	World Scientific		978-981-02-4885-7	2008	

	structures			
Le Méhauté, Bernard1927-	Water waves generated by underwater explosion	World Scientific	981-02-2083-9	1996
Losada, M.A. et al.	Apuntes de Puertos y Costas. Parte 1: Fundamentos del movimiento oscilatorio	Universidad de Granada		2000
Massel, Stanislaw R.	Ocean surface waves: their physics and prediction	World Scientific	981-02-2109-6	2005
Goda, Y.	Random seas and design of maritime structures	World Scientific	981-02-3256-X	2000
Masselink, Gerhard	Introduction to coastal processes and geomorphology	Arnold	0-340-76411-2	2003
Mei, Chiang C.	The Applied dynamics of ocean surface waves	World Scientific	9971-50-789-7	2003
Mei, Chiang C.	Theory and applications of ocean surface waves	World Scientific	981-238-894-X	2005
NEGRO, V., VARELA, O., GARCÍA, J. H. y LÓPEZ, J. S.	Diseño de diques verticales.	Colegio de Ingenieros de Caminos, Canales y Puertos		2001
NEGRO, V., VARELA, O., GARCÍA, J. H. y MORA, J. I.	Diseño de diques rompeolas.	Colegio de Ingenieros de Caminos, Canales y Puertos		2002
PUERTOS DEL ESTADO	Guía de buenas prácticas para la ejecución de obras marítimas			2008
PUERTOS DEL ESTADO	ROM 0.0, Procedimiento general y bases de cálculo en el proyecto de obras marítimas y portuarias.			2001
PUERTOS DEL ESTADO	ROM 0.2-90, Acciones en el proyecto de obras marítimas y portuarias			1990
PUERTOS DEL ESTADO	ROM 0.3-91, Clima marítimo en el litoral español: Oleaje			1991
PUERTOS DEL ESTADO	ROM 0.4-95, Clima marítimo en el litoral español: Viento.			1995
PUERTOS DEL ESTADO	ROM 0.5-05, Recomendación geotécnica para las obras marítimas y/o portuarias			2005
PUERTOS DEL ESTADO	ROM 0.5-94, Recomendaciones geotécnicas para el proyecto de obras marítimas y portuarias.			1994
PUERTOS DEL ESTADO	ROM 1.0-09, Recomendaciones del diseño y ejecución de las obras de abrigo			2009
PUERTOS DEL ESTADO	ROM 2.0-11, Recomendaciones para el proyecto y ejecución en las obras de atraque y amarre			2011
U. S. Army.	Coastal Engineering Manual.	Coastal Engineering Research Center.		2002
PUERTOS DEL ESTADO	ROM 3.1-99, Proyecto de la configuración marítima de los puertos, canales de acceso y áreas de navegación.			1999
PUERTOS DEL ESTADO	ROM 4.1-94, Proyecto y construcción de pavimentos portuarios			1994
PUERTOS DEL ESTADO	ROM 4.1-94, Recomendaciones para proyectar y construir pavimentos portuarios			1994
PUERTOS DEL ESTADO	ROM 5.1-05, Calidad de las aguas litorales en aguas portuarias			2005
Pedlosky, Joseph	Waves in the ocean and atmosphere: introduction to wave dyna	Springer	3-540-00340-1	2003
Peña Olivas, José Manuel de la	Guía técnica de estudios litorales: (manual de costas)	Colegio de Ingenieros de Caminos, Canales y Puerto	978-84-380-0342-8	2007
TAKAHASHI, S.	Design of vertical breakwaters			1996
Tucker, M. J.Malcolm John1924-	Waves in ocean engineering	Elsevier	0-08-043566-1	2001
Young, Ian R.	Wind generated ocean waves	Elsevier	0-08-043317-0 (hc)	1999
	Advances in coastal and ocean engineering	World Scientific	981-02-1824-9 (v.1)	1995

Design of coastal structures and sea defenses /	World Scientific,	978-981-4611-00-8	2015
Diques de abrigo en los puertos de interés general del Estad	Puertos del Estado,	978-84-88975-80-5	2012
Environmental design guidelines of low crested coastal struc	Elsevier	0-08-044951-4	2007
Handbook of coastal and ocean engineering	World Scientific	981-281-929-0	2010
Handbook of coastal engineering	McGraw-Hill	0-07-134402-0	2000
International compendium of coastal engineering /	World Scientific,	978-981-4449-42-7	2015
PIV and water waves	World Scientific	981-238-949-0	2004