Syllabus

Coastal Engineering and Construction

1. Subject:

Coastal Engineering and Construction

Degree

Civil Engineering – Highway Technology

Code

6523

2. Unit/Module:

Unit: Water Engineering II Module: Specific Technology

3. Department:

Department of Civil Engineering

4.a Professor:

Víctor López Ausín

4.b Coordinator:

VICTOR, LOPEZ AUSIN

5. Course and semester in which the subject is taught:

4th course, 8th Semester

6. Course Type : (introductory, mandatory or elective)

Mandatory

7. Number of ECTS credits for course:

3

8. Competences that the student must acquire when taking the subject:

Basic and General Competences of Degree: CB1; CB2; CB3; CB4; CB5; CG-01 Specific Competences of the Degree: CC-03 Capacity for construction and conservation of maritime works Instrumental Competences: I.01; I.02; I.03; I.04; I.05; I.06; I.07; I.08 Personal Competences: P.01; P.02; P.03; P.04; P.06; P.07 Systematic Competences: S.01; S.02; S.03; S.04; S.05; S.06; S.07; S.08 Transversal Competences: T.01; T.02; T.03 General Academic Competences: A.01; A.02; A.03; A.04; A.05; A.06

9. Course Overview:

9.1- Objectives
- Knowledge of the marine physical environment. - Determine the maritime climate that and its influence on coasts and ports, from the wind to the waves. Characterization of a wave. - Knowledge of wave mechanics and dynamics: progressive waves, phenomena associated with wave propagation, long waves. - Understand the nature and evolution of ports, their conditioning factors on the ship's side and the fundamental criteria for their spatial arrangement and planning, also introducing port exploitation, management and planning and port engineering works and actions. - Acquire knowledge about the types of external maritime works, the advantages and disadvantages of each type, the construction procedures and the functional requirements of maritime works. - Achieve capacity for the functional and structural design of vertical and sloping dikes. - Knowledge of coastal sedimentary dynamics.
9.2- Teaching units
Littoral Dynamics **Dynamics of ocean water masses** > Physico-chemical characteristics of water > Oceanic water bodies > Variations in mean sea level > Ocean Dynamics

Waves and Ocean Waves

> Wave Characteristic, Magnitude
> Classification of Waves according to depth
> Wave Equations
> Wave Propagation: phenomena in wave propagation **Wave Characterization**
> Information sources
> Short Term Swell Description
> Long-Term Wave Description. Extreme Characterization
> ROM program

External Maritime Works
External Maritime Works

> Classifications
> Stages in the process of designing a protective structure
> Typological characteristics of maritime structures, dikes and slopes
> Parts of a sloping dam
> Advantages and disadvantages
> Elements and construction process
> Sizing of the main mantle and filters
> Conditioners emerging from a slope dam
> Types of Vertical Facing Dams
> Parts of a Vertical Dam
> Construction process
> Advantages and limitations
> Failure modes
> Calculation: Structural Stability

Coastal Engineering

The Coast

> Definition and Classification of coasts
> Sedimentary balance. Sea level oscillations
> Coastal Law (Law 22/88 and Regulation 1471/89)
> Coastal forms

9.3- Bibliography
Bibliography
De la Peña Olivas, Jose Manuel, (2007) Technical Guide for Coastal Studies. Coastal Manual, 1st ed., College of Civil Engineers, Channels and Ports, 9788438003428, Goda, Yoshimi, (2000) Random Seas and Design of Maritime Structures, 2nd ed., Worl Scientific Publishing Co Pte Ltd, 9789810232566, Negro Valdecantos, Vicente and Varela Carnero, Ovidio, (2009) Design of Breakwater Dams, 2nd ed., College of Civil Engineers of Roads, Canals and Ports, 9788438004029, Negro Valdecantos, Vicente and Varela Carnero, Ovidio, (2008) Design of Vertical Dikes, 2nd ed., College of Civil Engineers, Canals and Ports, 9788438003749, Pickard, George L. and Emery, William J., (2007) Descriptive physical oceanography: an introduction, 5th, Oxford: Butterworth-Heinemann, 9780750627597, Pond, Stephen and Pickard, George L., Introductory Dynamical Oceanography, Butterworth-Heinemann Ltd., 9780750624961,
FURTHER READING
Anikouchine, William A. and Sternberg, Richard W., The World Ocean, Prentice Hall, 9780139677526, Various, (1990) ROM 0.2-90: Actions in the project of maritime and port works, Ministry of Public Works and Urbanism, 9788474337013, Various, (1995) ROM 0.4-95: Climate Actions II: Wind, Ministry of Public Works, Transport and Environment, 8488975090, Various, (1992) ROM 0.3-91: Swell and Atlas of the Maritime Climate in the Spanish Coast, General Directorate of Ports, 84743381X, Various, (2010) ROM 1.0-09: Recommendations for the design and execution of shelter works, Puertos del Estado, 9788488975737,

10. Teaching and learning methodology and its relationship with the skills that the student must acquire:

Methodology	Related competancy	Contact hours	Out-of-class hours	Total
Theoretical classes	CG01; CG08; I.01; I.03; I.06; P.06, S.01; S.08 A.01; A.05; A.06; CC.03; CB1-CB5	11	11	22
Practical classes (small group)	CG01; CG08; I.01; I.02; I.05; I.06; I.07;	11	22	33

	I.08 P.01; P.02; P.04; P.06; P.07; S.01; S.03; T.01; A.01; A.02; A.03; A.05; A.06; CC.03; CB1-CB5			
Carrying out of work, reports, reports and evaluation tests	I.01; I.03; I.04; I.05; I.06; I.07; I.08; P.01; P.02; P.04; P.06; P.07; S.01; S.02; S.03; S.04; S.05; S.07; A.01; A.03; A.04; A.05; A.06; CC.03; CB1-CB5	5	15	20
Total		27	48	75

11. Grading System:

The students will carry out individually and in writing various assignments that will be proposed during the development of the subject, as well as tests or assignments 1, 3 and 4. In addition, the student's knowledge will be evaluated by means of a questionnaire when carrying out a work for their account on complementary issues of maritime works, assignment no. 2.
The minimum mark to pass each is 5 out of 10.
In the second call evaluation, the student will be evaluated for those assignments that he / she has not passed in the first call.

Assessment	First call evaluation	Second call evaluation
1.Final test I: written test of practical exercise/s at the end of unit I	30 %	30 %
2.Individual work I	15 %	15 %
3.Final test II: written test of practical exercise/s at the end of unit II	25 %	25 %
4.Continuous assessment: questionnaires	30 %	30 %
Total	**100 %**	**100 %**

Evaluation:

The students individual work will examined in the same term as their peers, and will be evaluated in a final exam, on the official exam date, of each of the remaining assignments or tests. Likewise, to pass the subject you must get a grade higher than 5 out of 10 in each of the parts.

12. Learning resources and tutorial support:

- Notes of the subject prepared by the teacher responsible for it
- Proposals for practical exercises
- Whiteboard and Projectors
- Computer applications for solving exercises
- Related web pages
- Library of the Higher Polytechnic School with bibliographic documentation adapted to the contents of the subject.
- Interactive applications on the UBUvirtual Platform
- Individualized or group tutorials at the request of the students

13. Calendars and schedules:

The calendar approved by the School Board of the Higher Polytechnic School and the schedules published on the official boards

14. Language of instruction:

Spanish