



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2023/2024
MASTER'S DEGREE (MSC)	ENGINEERING AND INNOVATIVE TECHNOLOGIES FOR THE ENVIRONMENT
SUBJECT	COASTS PROTECTION
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50372-Ingegneria per l'ambiente e territorio
CODE	09164
SCIENTIFIC SECTOR(S)	ICAR/02
HEAD PROFESSOR(S)	CIRAOLLO GIUSEPPE Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	9
INDIVIDUAL STUDY (Hrs)	144
COURSE ACTIVITY (Hrs)	81
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	2
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	<p>CIRAOLLO GIUSEPPE</p> <p>Tuesday 11:00 13:00 Ufficio del Professore (II piano Ed. 8 - blocco "Idraulica")</p> <p>Thursday 11:00 13:00 Ufficio del Professore (II piano Ed. 8 - blocco "Idraulica")</p> <p>Friday 9:00 14:00 Per gli studenti del CdS in Biotecnologie e Innovazione Tecnologica, presso le strutture del polo didattico di Trapani. I ricevimenti, su richiesta, possono essere svolti anche su piattaforma teams. Ulteriori o differenti incontri possono essere concordati con il docente</p>

DOCENTE: Prof. GIUSEPPE CIRAIOLO

PREREQUISITES	Basic and advanced hydraulic
LEARNING OUTCOMES	Knowledge and understanding skills. The student will deepen the skills achieved in the basic hydraulic courses, improving the knowledge of coastal processes and hydrodynamic problems. Skills to apply knowledge and understanding Main objective of the course is to provide the students with advanced skills in the analysis of hydrodynamic processes relevant in coastal engineering. Making judgments The variety and complexity of the problems discussed during the course requires that the student achieves the ability to combine the solution of specific methodologies independently of each addressed problem. Communication skills During the exercises in the classroom and in the lab, the student will be invited to discuss the used procedures and methodologies, thus acquiring the ability to explain the meaning of their work. Such capacity will be directly evaluated in the final exam. Learning skills The provided knowledge will allow the students to analyze and study complex coastal engineering problems (other than those covered in the course), thus acquiring the ability to further deepen their expertise throughout their subsequent professional or university experience.
ASSESSMENT METHODS	Oral test. The oral examination consists of the discussion of the reports of the practice exercises and of the basic principles of coastal engineering. The final assessment takes into account equally the quality of the reports and of the oral tests and is based on the following requisites: a) knowledge and presentation skills of the fundamental principles; b) ability to apply the principles to practical problems ; c) skills in solving new problems. The examination is passed if the student meets the requirement a) and, at least for simple problems, the requirement b). The requirement c) is a necessary condition to obtain an excellent rating (28 and up). The score is given in thirtieths.
EDUCATIONAL OBJECTIVES	The general aim of the course is to provide to the students the theoretical knowledges and the advanced and operational methodologies of coastal hydrodynamics analysis and the most appropriate interventions and works for coastal protection. The full understanding of interactions waves-infrastructure is one is also an important objective of the course.
TEACHING METHODS	Frontal lecturing, practical, field visits
SUGGESTED BIBLIOGRAPHY	<ul style="list-style-type: none"> - Dispense, appunti e slides del corso - PETTI MARCO - FONDAMENTI DI IDRAULICA MARITTIMA E COSTIERA - Casa Editrice FORUM - TOMASICCHIO UGO - MANUALE DI INGEGNERIA PORTUALE E COSTIERA - Casa editrice HOEPLI - Benassai G., 2006. Introduction to coastal dynamics and shoreline protection. WIT press, Southampton. - CEM Coastal Engineering Manual.

SYLLABUS

Hrs	Frontal teaching
4	Coastal characteristics. Coastal areas classification
2	Coastal climate
3	Wave processes: waves generation
2	Marine wave measurements systems
4	General formulation of marine wave propagation
4	Linear theory of waves propagation
4	Non linear theory: Stokes
2	Waves propagation on a variable bottom
4	Refraction and Wave breaking
2	Wave propagation in presence of discontinuities
2	Wave propagation on submerged structures
2	Wave breaking on natural beaches
5	Real sea waves, Wave spectrum and significant wave height
4	Coastal Sediment transport
4	Artificial protection structures
5	Fundamentals of hard and soft coastal structures
Hrs	Practice
20	Exercises on coastal wave process and erosion assessment
8	Design of Coastal Structures and Sea Defenses