



UNIVERSITÀ DEGLI STUDI DI PALERMO

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| DEPARTMENT | Ingegneria |
| ACADEMIC YEAR | 2022/2023 |
| 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

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| 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 | - 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 |
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| 2 | Coastal characteristics. Coastal areas classification |
| 2 | Coastal climate |
| 2 | Wave processes: waves generation |
| 2 | Marine wave measurements systems |
| 4 | General formulation of marine wave propagation |
| 2 | Linear theory of waves propagation |
| 4 | Non linear theory: Stokes |
| 2 | Waves propagation on a variable bottom |
| 4 | Wave breaking |
| 2 | Wave propagation in presence of discontinuities |
| 2 | Wave propagation on submerged structures |
| 2 | Wave breaking on natural beaches |
| 4 | Artificial protection structures |
| 5 | Fundamentals of hard and soft coastal structures |
| 4 | Coastal Sediment transport |
| Hrs | Practice |
| 18 | Exercises on coastal wave process |
| 22 | Design of Coastal Structures and Sea Defenses |