UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2020/2021
MASTER'S DEGREE (MSC)	ENGINEERING AND INNOVATIVE TECHNOLOGIES FOR THE ENVIRONMENT
SUBJECT	COMPLEMENTS OF ENVIRONMENTAL HYDRAULICS
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50372-Ingegneria per l'ambiente e territorio
CODE	08999
SCIENTIFIC SECTOR(S)	ICAR/01
HEAD PROFESSOR(S)	NAPOLI ENRICO Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	9
INDIVIDUAL STUDY (Hrs)	144
COURSE ACTIVITY (Hrs)	81
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**NAPOLI ENRICO** Thursday 12:00 13:30 Ufficio Enrico Napoli - Secondo piano Friday 12:00 13:30 Ufficio Enrico Napoli - Secondo piano

DOCENTE: Prof. ENRICO NAPOLI

PREREQUISITES	Basic Fluid mechanics knowledge. Steady-state pipe and channel flows.
LEARNING OUTCOMES	Knowledge and understanding skills. The student will deepen the skills achieved in the basic hydraulic courses, improving the knowledge of complex 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 environmental 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 hydraulic 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 environmental fluid mechanics. 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 course aims to provide students with advanced skills in the field of Fluid Mechanics, with particular reference to the most important issues that the graduates in the Master's Degree in Environmental and Land Engineering will face in the future professional activity. In particular, the aim is to provide the expertise needed to solve problems related to the most important hydraulic infrastructures and to the analysis of free-surface natural water bodies (rivers, lakes, coastal waters).
TEACHING METHODS	Lectures and exercises
SUGGESTED BIBLIOGRAPHY	Curto – Napoli. Idraulica Vol 1 e Vol. 2 (2005-2007). Editrice BIOS Dispense a cura del docente

SYLLABUS

Hrs	Frontal teaching
6	Unsteady oscillatory and elastic flows
5	Steady Free-surface flows and Weirs
4	Unsteady channel flows
3	Groundwater flows
6	Turbulence modelling
3	Advection-diffusion equation
6	Basic computational fluid dynamics
3	Elements of hydrodynamics of oceans and atmosphere
4	Coastal water processes

Hrs	Practice
6	Basic Matlab Programming
5	Exercises on the water hammer
3	Exercises on channel flows with weirs
3	Exercises on unsteady free-surface flows
8	Exercises on turbulence modelling
5	Exercises on tracer transport
12	Exercises on coastal hydrodynamic processes