



FLOOD PROPAGATION	
Enrollment year	2015/2016
Academic year	2016/2017
Regulations	DM270
Academic discipline	ICAR/02 (MARITIME HYDRAULIC CONSTRUCTION AND HYDROLOGY)
Department	DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE
Course	CIVIL ENGINEERING
Curriculum	IDRAULICO
Year of study	2°
Period	1st semester (26/09/2016 - 13/01/2017)
ECTS	6
Lesson hours	50 lesson hours
Language	ENGLISH
Activity type	WRITTEN AND ORAL TEST
Teacher	PETACCIA GABRIELLA (titolare) - 6 ECTS
Prerequisites	The Course of deals with theoretical and application matters chiefly referred to the Teaching Fields of : Hydraulic and Fluid Mechanics .It is useful for the students a preliminary frequency of the teaching Matters above mentioned, for an easier understanding of the object of the Course
Learning outcomes	Give the concepts necessary to use one and two dimensional unsteady flood propagnion models. The last part of the course is dedicated to the use of ORSADEM software
Course contents	<p>Introduction: steady and unsteady flow, uniform and varied flow, pipe flow vs open channel flow</p> <p>De Sant Venant equations (1d), divergent and non divergent form, supplementary terms and coefficients</p>

Initial and boundary conditions

Discontinuous solutions: Bores

Simple wave, Dam break waves

Italian Regulations on Dam safety

Simplified channel flow equations

Numerical solution of the unsteady flow equations (method of characteristics, explicit and implicit

finite differences methods, numerical integration schemes: predictor corrector, flux splitting,

upwind and downwind; accuracy of the numerical method, stability analysis

Shallow water equations (2D)

Mesh generation (structured/non structured)

Simulation of flow in natural streams (1d vs 2D models, topological and hydraulic discretization,

some computational problems in rivers and floodplains, flooded area mapping techniques)

Models calibration and data needs

Flood wave propagation through hydraulic singularities

Introduction to the use of ORSADEM code

Case study: analysis of Sella Zerbino dam break (Italy)

Teaching methods

Oral and practical lessons

Reccomended or required readings

V.T. Chow 1959 Open Channel Hydraulics Mac Graw Hill Book , New York

J.A. Cunge, F.M. Holly, & A.Vervev, Practical aspects of Computational River Hydraulics. 1980.

Pitman Publ. Inc, London

K. Mahmood , V.Yevjevich 1975. Unsteady flow in open channel, Water Resources publications, Colorado, 1975.

H. Chanson 2004 The Hydraulics of Open Channel Flow: An Introduction, Second Edition,

	<p>Elsevier Oxford</p> <p>T.W. Sturm. 2001. Open Channel Hydraulics, Mc Graw Hill, Singapore</p> <p>ORSADEM reference manual</p> <p>Slides of the course (see Kiro: http://kiro2014.unipv.it/idcd/)</p>
Assessment methods	<p>Oral Exam</p>
Further information	
Sustainable development goals - Agenda 2030	<p>\$lbl legenda sviluppo sostenibile</p>