



HYDROLOGICAL MODELLING AND RISK ASSESSMENT

Enrollment year	2019/2020
Academic year	2020/2021
Regulations	DM270
Academic discipline	ICAR/02 (MARITIME HYDRAULIC CONSTRUCTION AND HYDROLOGY)
Department	DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE
Course	ENVIRONMENTAL ENGINEERING
Curriculum	Energie rinnovabili
Year of study	2°
Period	2nd semester (08/03/2021 - 14/06/2021)
ECTS	6
Lesson hours	45 lesson hours
Language	Italian
Activity type	WRITTEN TEST
Teacher	CREACO ENRICO FORTUNATO (titolare) - 6 ECTS
Prerequisites	Having passed the exams of Mathematical analysis, Physics and Hydrology
Learning outcomes	The objective of this module is to provide students with complementary concepts of Hydrology, with emphasis on issues related to the modelling and estimation of flood risk
Course contents	<p>1 – Preliminary notions of optimisation; quadratic programming and genetic algorithms.</p> <p>2 – Additional concepts on UH and IUH. Parameterization through quadratic programming and genetic algorithms.</p> <p>3 – Application of UH and IUH to real case studies and exercise.</p> <p>4 – Full Hydrological model for the analysis of water availability in a catchment. Parameterization through a genetic algorithm.</p> <p>5 – Application of SIMDEUM to a real case study and exercise.</p>

	<p>6 – system of random variables and applications to Hydrology.</p> <p>7 – Multiple linear regression. Stochastic processes and hydrological applications.</p> <p>Exercise.</p> <p>8 – Concept of RISK.</p> <p>9 – Models for estimating hazard.</p> <p>10 – Models for evaluating exposition and vulnerability.</p> <p>11 – GIS applications.</p> <p>12 – Exercise on flood risk assessment.</p>
Teaching methods	Lectures and exercises taught by the lecturer in the classroom
Reccomended or required readings	<ul style="list-style-type: none"> ● V.T. Chow, D.R. Maidment, L.W. Mays. Applied Hydrology. New York, Mc Graw-Hill Book Company, 1988 ● R.K. Linsley, M.A. Kohler, J.L.H. Paulus. Applied Hydrology. New York, Mc Graw-Hill Book Company, 1949 ● U. Maione, U. Moisello. Elementi di statistica per l'idrologia. Pavia, la Goliardica Pavese, 1993 ● U. Moisello. Idrologia tecnica. Pavia, Medea, 2014 (Archimede 3)
Assessment methods	The student's preparation will be assessed with a written test with four theoretical questions with open reply and an exercise
Further information	
Sustainable development goals - Agenda 2030	\$lbl legenda sviluppo sostenibile