



HYDRAULIC CONSTRUCTIONS (URBAN)

Enrollment year	2017/2018
Academic year	2020/2021
Regulations	DM270
Department	DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE
Course	
Curriculum	PERCORSO COMUNE
Year of study	4°
Period	Annual (28/09/2020 - 14/06/2021)
ECTS	9
Language	Italian
Prerequisites	Fundamentals of calculus (integrals, derivatives, differential equations) and mechanics (static and dynamic equilibrium).
Learning outcomes	The Course teaches the fundamental aspects of hydraulics and hydrology, in order to tackle the main hydraulic issues in building design.
Course contents	The Course plans to teach those fundamentals in hydraulics and hydrology which are needed to tackle the main practical problems of these subjects in the urban planning and building fields. In this frame, the Course consists of two parts: in the introductory part, all the basic knowledge in hydraulics is explained, with a particular emphasis on the characterization of flows in pipes and of uniform flows in open channels; in the second part, the focus is on urban hydraulic works and, in particular, on aqueduct networks and on sewer systems.
Teaching methods	Lectures and practical classes
Reccomended or required readings	Gallati, Sibilla. Fondamenti di idraulica. Carocci Editore. AA. VV.. Sistemi di fognatura : manuale di progettazione. Hoepli. Ippolito G.. Appunti di costruzioni idrauliche. Ed. aggiornata a cura di G. De Martino.. Liguori.

Papiri S.. Acquedotti. (Dispensa in distribuzione).

Papiri S.. Fognature. (Dispensa in distribuzione).

Assessment methods

Written test (optional additional oral test)

The activity is split

504515 - **HYDRAULIC CONSTRUCTIONS (URBAN) A**

504516 - **HYDRAULIC CONSTRUCTIONS (URBAN) B**



HYDRAULIC CONSTRUCTIONS (URBAN) A

Enrollment year	2017/2018
Academic year	2020/2021
Regulations	DM270
Academic discipline	ICAR/02 (MARITIME HYDRAULIC CONSTRUCTION AND HYDROLOGY)
Department	DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE
Course	
Curriculum	PERCORSO COMUNE
Year of study	4°
Period	2nd semester (08/03/2021 - 14/06/2021)
ECTS	3
Lesson hours	27 lesson hours
Language	Italian
Activity type	WRITTEN TEST
Teacher	FRANCHIOLI LUIGI DANTE - 3 ECTS
Prerequisites	Fundamentals of calculus (integrals, derivatives, differential equations) and mechanics (static and dynamic equilibrium). Basic knowledge of hydraulics.
Learning outcomes	Students will acquire conceptual and practical knowledge on the design of water supply and distribution systems and on urban drainage systems (both sanitary and stormwater systems).
Course contents	WATER SUPPLY AND DISTRIBUTION SYSTEMS. Capture, transport and distribution for water supply systems. URBAN DRAINAGE SYSTEMS Separate and combined sewerage systems. Plan of the sewerage and

	definition of the slopes. Calculation of diameters for sewage collectors.
Teaching methods	Lectures and practical classes.
Reccomended or required readings	Lecture notes on the topics of the course. Milano V. (1996). Acquedotti. Guida alla progettazione. Hoepli, ISBN: 88-203-2292-7. A.A.V.V. (1997). Sistemi di fognatura. Manuale di progettazione. Hoepli, ISBN:88-203-2442-3.
Assessment methods	Written test on the topics of the course. Optional oral examination for written test result equal or greater than 25/30. Maximum mark of 27/30 without oral exam.
Further information	Written test on the topics of the course. Optional oral examination for written test result equal or greater than 25/30. Maximum mark of 27/30 without oral exam.
Sustainable development goals - Agenda 2030	\$lbl_legenda_sviluppo_sostenibile



HYDRAULIC CONSTRUCTIONS (URBAN) B

Enrollment year	2017/2018
Academic year	2020/2021
Regulations	DM270
Academic discipline	ICAR/02 (MARITIME HYDRAULIC CONSTRUCTION AND HYDROLOGY)
Department	DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE
Course	
Curriculum	PERCORSO COMUNE
Year of study	4°
Period	1st semester (28/09/2020 - 22/01/2021)
ECTS	6
Lesson hours	52 lesson hours
Language	Italian
Activity type	WRITTEN TEST
Teacher	SIBILLA STEFANO (titolare) - 5 ECTS FENOCCHI ANDREA - 1 ECTS
Prerequisites	Fundamentals of calculus: limits, derivatives, integrals. Mechanics: equilibrium, energy, conservation principles. Analytical mechanics: vector calculus.
Learning outcomes	At the end of the Course, the student should know and understand the basic principles which regulate the liquid motion in pipes and open channels. He must also be able to apply these principles to the solution of simple hydraulic engineering problems, such as the evaluation of the force exerted by the liquid on the rigid walls, the determination of discharge and head losses in pipe flows, the evaluation of energy exchanges between liquid flows and hydraulic machines.
Course contents	Fluids as a continuum. Pressure and viscous stress. Hydrostatics: Stevin's Law and pressure distribution in liquids.

	Preassure measurement. Hydrostatic forces on plane and curved walls. Kinematics of liquids: Eulerian and Lagrangian point of view. Definition of flow lines, fluxes, flow rate and mean velocity. Hydrodynamics: conservation principles. Continuity equation and Bernoulli's Theorem. Head losses: laminar and turbulent flows. Pipe flows: smooth wall and roughness, Moody's chart. Effects of geometry variation. Valves. Hydraulic machines: pumps and turbines. Typical layout of hydropower plants.
Teaching methods	Lectures and practical classes
Reccomended or required readings	Gallati M., Sibilla S. . Fondamenti di Idraulica. Carocci editore, Roma. Citrini D., Nosedà D.. Idraulica. Tamburini, Milano.
Assessment methods	The evaluation will be obtained through a written test, which will include in general the solution of two exercises, the first on the evaluation of hydrostatic forces and the second on the solution of a problem on pipe flows (e.g.: determination of the flow rate and of head losses, energy exchanges in hydropower or pumping plants, etc.) The test will last for 2 hours: the use of textbooks, tables and computing machines is allowed. The evaluation will be given in a 0-30 grade scale.
Further information	
Sustainable development goals - Agenda 2030	\$lbl_legenda_sviluppo_sostenibile