



VALORIZATION AND OPTIMIZATION OF RESIDUES FROM WATER AND WASTE TREATMENT

Enrollment year	2020/2021
Academic year	2021/2022
Regulations	DM270
Academic discipline	ICAR/03 (ENVIRONMENTAL AND HEALTH ENGINEERING)
Department	DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE
Course	ENVIRONMENTAL ENGINEERING
Curriculum	Territoriale
Year of study	2°
Period	1st semester (27/09/2021 - 21/01/2022)
ECTS	6
Lesson hours	50 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	COLLIVIGNARELLI MARIA CRISTINA (titolare) - 6 ECTS
Prerequisites	Knowledge of the main technologies for the treatment of wastewater, for the treatment of drinking water, for the treatment/disposal/recovery of solid urban waste and the related fields of application. Knowledge of the general sizing of plants (wastewater treatments, drinking water treatment, waste treatment).
Learning outcomes	The course aims to provide skills for the optimization (through managerial and structural upgrades) of the performance of water and waste treatment plants and at the same time the enhancement of residues.
Course contents	- OPTIMIZATION OF TREATMENT PLANTS AND RESIDUES Optimization criteria of treatment plants. Drafting of monitoring plans. Biological treatability. Functionality checks (hydrodynamic, oxygen transfer capacity, sedimentation). Energy saving in water treatment plants. Performance indices.

	<p>- VALORIZATION OF RESIDUES FROM WATER AND WASTE TREATMENT</p> <p>Definition and treatment of aqueous waste. Enhancement of sandy residues (from pre-treatments), sludge residues (chemical and biological) and effluents (aqueous residues) of treatment plants. Visit to an aqueous waste treatment plant.</p>
Teaching methods	<p>The course is organized in lectures and exercises. The training activities are completed by a visit to an aqueous waste treatment plant.</p> <p>-Lectures (hours/year in lecture theatre): 34 -Practical class (hours/year in lecture theatre): 14 -Practicals / Workshops (hours/year in lecture theatre): 4</p>
Reccomended or required readings	<p>- Bertanza Giorgio, Collivignarelli Carlo (2012). Impianti di trattamento acque: verifiche di funzionalità e collaudo – manuale operativo. Hoepli.</p> <p>- Bertanza Giorgio, Foladori Paola, Guglielmi Lorena (2018). Recupero di materia e di energia negli impianti di depurazione. Maggioli Editore - Ambiente & Territorio.</p> <p>- Metcalf & Eddy (2005). Ingegneria delle acque reflue: trattamento e riuso. McGraw Hill.</p>
Assessment methods	<p>- modality: written test followed by oral test (unless otherwise specified due to the pandemic condition in progress)</p> <p>- evaluation parameters: ability to discursively organize knowledge; critical reasoning skills on the study carried out; quality of exposure, competence in the use of specialist vocabulary. The questions will focus on both the theory part and the exercise part with the request for numerical resolutions.</p> <p>- the type of evaluation used: mark out of thirty</p> <p>- number and types of tests that contribute to the final assessment: final exam (written + oral). Access to the oral exam is allowed upon passing the written exam (with at least 18/30). There are no intermediate tests during the course.</p> <p>- any materials useful for taking the test and allowed during it: calculator. Consultation of notes / texts is not allowed.</p>
Further information	<p>Experimental theses are available on the topics explained in the course. For further information, please contact the Professor via email.</p>
Sustainable development goals - Agenda 2030	<p>Goal 6; Goal 7; Goal 11; Goal 12 \$lbl legenda sviluppo sostenibile</p>