

Name	Wastewater treatment processes
ECTS credits	4
Year / Semester	II / 2°
Specific learning outcomes	<p>On successful completion of this module students should be able to:</p> <p>1 – The characterization of the discharges and the metrics of the different biological wastewater treatment processes,</p> <p>2 – Design of different biological wastewater treatment processes</p> <p>3 – Participate in class discussions with colleagues and with teachers</p>
Contents	1. Kinetic Constants of Biological Reactions; 2. Models of biological reactors; 3. Wastewater treatment processes; 4. Sludge treatment.
Teaching and learning methods	Face to face, 45 hours
Teaching techniques	Practical classes, 45 hours
Assessment methods	<p>Written.</p> <p>First and second written tests are foreseen.</p> <p>The first written test will be devoted to the assessment of the level of achievement of the first part concerning the characterization of the discharges and the metrics of the different biological processes of wastewater treatment.</p> <p>The second written test will be devoted to the assessment of the level of achievement of the second part concerning Design of different biological wastewater treatment processes.</p>
Assessment criteria	<p>In the first test students should demonstrate their ability to calculate the different parameters for wastewater characterization and pre-treatments process. In the second test students will be able to calculate and design the different biological wastewater treatment process (activated sludge, trickling filter, lagoons process, nitrification and de-nitrification, phosphorus elimination process).</p> <p>Finally, students' ability to participate in class discussions with teachers and colleagues will be assessed in practical classes.</p>
Assessment metrics	Attribution of a final grade
Criteria of attribution of the final grade	<p>The grade goes from 1 (minimum) up to 20 (maximum). The minimum threshold to pass is 7. To pass the exam students should obtain the minimum evaluation in all the assessments.</p> <p>The final grade will be determined according to the following rules:</p> <ul style="list-style-type: none"> - Written exam: 50% - term written test: 20% - Practical classes : 30%
Preparatory course units	N.A.
Didactic material	<p>Inc. Metcalf & Eddy (Author), George Tchobanoglous (Author), H. David Stensel Professor of Civil and Environmental Engineering (Author), Ryujiro Tsuchihashi (Author), Franklin L. Burton (Author) Wastewater Engineering: Treatment and Resource Recovery 5th Edition.</p>