



Scenario of the Module 7

1.	Title of the module	Water
2.	General aim	Comprehensive water resource management, encompassing groundwater, surface water, water footprint, and wastewater, is essential to ensure the sustainable availability of this vital resource in a constantly growing urban and population-centric world. Furthermore, the implementation of sustainable urban drainage systems has become critical in addressing flooding and contamination issues in cities, promoting practices such as green roofs and permeable pavements that reduce runoff and enhance water quality, thus contributing to the preservation of our ecosystems and human well-being in an ever-expanding urban environment.
3.	Goals	
	Student knows	Water Resources: Understanding the availability, distribution, and management of water sources; Natural Resources Management: Knowledge of sustainable practices for managing natural resources, with a specific emphasis on water; Hydric Footprint: Awareness of the impact of individual and collective water consumption on the environment; General concepts of wastewater treatment and water Reuse: Familiarity with the concept of reusing water and its implications in various contexts; Good Practices: Adopting and promoting best practices in water management and conservation.
	Student is able	Diagnosing: The ability to effectively assess and evaluate water-related issues; Water Cleaning: Proficiency in techniques and methods for purifying wastewater; Field-Worthy Water Safety: Being capable of ensuring water safety under field conditions; To understand the importance to care about water issue. To be conscious about saving water and avoid pollution
	Student understands	Critical thinking, awareness of water problems, participative approach, social responsibility
4.	Methods and forms of work	Flipped classroom (mentimeter), game, quiz
5.	Teaching aids	Reading material: Content of the module. Calvo-Flores, F.G., Isac-García, J., Dobado, J. A. (2017). <i>Emerging Pollutants: Origin, Structure, and Properties</i> . Wiley. Flor, C, Durão A, Carvalho Fátima (2022) Ecoinovação em Processos de Tratamento de Efluentes Agroindustriais e Reutilização de Águas Residuais na Indústria Alimentar. CNESA, Santarem Franco, A. A., Arellano, J. M., Albendín, G., Rodríguez-Barroso, R., Zahedi, S., Quiroga, J. M., & Coello, M. D. (2020). Mapping microplastics in Cadiz (Spain): Occurrence of microplastics in municipal and industrial wastewaters. <i>Journal of Water Process Engineering</i> , 38(June), 101596. https://doi.org/10.1016/j.jwpe.2020.101596 Hernández-Sánchez, C., González-Sálamo, J., Ortega-Zamora, C., Jiménez-Skrzypek, G., & Hernández-Borges, J. (2020). Microplastics:



	<p>An Emerging and Challenging Research Field. <i>Current Analytical Chemistry</i>, 17(7), 894–901. https://doi.org/10.2174/1573411016999201029194655</p> <p>Jiang, J. Q., Zhou, Z., & Sharma, V. K. (2013). Occurrence, transportation, monitoring and treatment of emerging micro-pollutants in waste water - A review from global views. <i>Microchemical Journal</i>, 110, 292–300. https://doi.org/10.1016/j.microc.2013.04.014</p> <p>Marecos Do Monte, H., Santos, T., Barreiros, A. & Albuquerque, A. (2016). Tratamento de águas residuais – Operações e processos de tratamento físico e químico. CT05, ERSAR, Lisboa, Portugal, 544 p. (ISBN 978 989 8360 32 8).</p> <p>Metcalf, & Eddy (2016). Wastewater Engineering: Treatment, Disposal and Reuse (International edition ed). MacGraw-Hill., New York.</p> <p>Plattard, N., Dupuis, A., Migeot, V., Haddad, S., & Venisse, N. (2021). An overview of the literature on emerging pollutants: Chlorinated derivatives of Bisphenol A (ClxBPA). <i>Environment International</i>, 153. https://doi.org/10.1016/j.envint.2021.106547</p> <p>Zhou, S., Di Paolo, C., Wu, X., Shao, Y., Seiler, T. B., & Hollert, H. (2019). Optimization of screening-level risk assessment and priority selection of emerging pollutants – The case of pharmaceuticals in European surface waters. <i>Environment International</i>, 128(April), 1–10. https://doi.org/10.1016/j.envint.2019.04.034</p>
6. Classes schedule:	<p>15 min. Introductory activity to check knowledge in the field of water and the actual issues</p> <p>35 min. Explanation of Water management issues and characteristics and differences between groundwater and surface water</p> <p>15 min., Explanation Hydric footprint: blue, grey and green</p> <p>30 min., Wastewater regeneration</p> <p>35 min., Sustainable Urban Drainage Systems (SUDS)</p> <p>05 min., Good practices to apply in water management</p>