

Urban Waterworks:

Calendar: 1st Year 2nd Semester

Contact Hours: 15h00T +30h00 T/P+ 7h30 EL/OT

Syllabus:

Introduction. Urban hydraulic systems. Urbanization and its consequences in hydraulic systems.

Analysis, monitoring, evaluation and rehabilitation of urban water supply and sanitation systems. Water supply systems. Drainage systems for domestic, commercial and industrial wastewater. Drainage systems for rainwater.

Integration of streams in urban areas. Examples, possible solutions and their advantages and disadvantages. Integration into the urban landscape.

Hydrodynamics computer modeling. Materials and design solutions.

Low impact urban developments. Planning and assessment of possible solutions.

Device control stormwater. Evaluation of implemented solutions performance.

Management, prevention and mitigation of urban flooding. National, European and international law. Flood risk area delimitation. Flood risk assessment and classification.

Intended learning outcomes of the curricular unit:

It is intended that the course of Urban Waterworks will provide expertise in design of hydraulic structures in urban space. Advanced knowledge in the fields of integration of the source control solutions, LIDs (Low Impact Developments) and flood management, prevention and mitigation of urban flooding will also be transmitted to students, thus conferring engineering expertise in the field of urban flooding.

Demonstration of the syllabus coherence with the curricular unit's intended learning outcomes:

This course aims to ensure that future professionals are deeply knowledgeable of the issues discussed during the semester. These professionals should be able to solve the challenges of this area of expertise in a structured and rigorous way and address civil engineering problems in a multidisciplinary perspective, well-framed in scientific-technical, economic, social and environmental contexts. They should be able to communicate rationally the results of their work to the technical community and society in general, enhance leadership skills, entrepreneurship and team work, taking into account the different economic and international competitiveness contexts.

The syllabus, focusing on different types of works and hydraulic structures in urban environments (e.g., water supply and sanitation networks, culverts), helps to achieve the learning objectives of the course. A strong component of the syllabus is centered on the problem of urban flooding, which includes aspects from conception of engineering solutions to the evaluation of the solutions already implemented, thus meeting the objectives of the course in this subject. The syllabus forms a coherent whole because they allow framing, from the perspective of the civil engineer, the different aspects of the urban water cycle which are particularly relevant to the profession.

Teaching methodologies (including evaluation):

Lectures and theoretical-practical classes with exposition of matter relevant to the syllabus, discussion of case studies and computational modeling. Tutorial lessons to support students in their practical work.

Demonstration of the teaching methodologies coherence with the curricular unit's intended learning outcomes:

The teaching methodologies are consistent with the objectives of the course as the expository methodology combined with practical work and discussion of case studies allows achieving all the objectives of the course.

The methodology allows transmitting a set of information and advanced level practical work with a strong focus on stream flow computer modeling and design of engineering solutions. Students will familiarize themselves with the tools (e.g. , software) and processes (e.g., design solutions) that will deal with in a professional environment.

The evaluation methods, in which students will be required to demonstrate they have acquired the knowledge associated with the different chapters of the program, allow assessing if all goals were achieved.