Universidad Zaragoza

Academic Year/course: 2024/25

66224 - Water Quality and Treatment

Syllabus Information

Academic year: 2024/25
Subject: 66224 - Water Quality and Treatment
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 531 - Master's in Chemical Engineering
ECTS: 6.0
Year:
Semester: Second semester
Subject type: Optional
Module:

1. General information

The objective of this subject is to provide the student with the scientific and technical knowledge that will allow them to approach a water quality and pollution control strategy, intensifying the training acquired in the Environmental Engineering subject, a compulsory subject of the common module of the industrial branch of the Degree in Engineering; in particular, the following aspects are studied in depth: Water regulations, control of the status and quality of natural waters (ground and surface), water uses: criteria, quality standards, control of diffuse and point source pollution sources, sizing and operation of water treatment facilities.

2. Learning results

- To plan a control strategy and determine the chemical, ecological and final status based on the experimental results obtained in the analysis of physical-chemical, biological and hydromorphological parameters.
- To determine the suitability of water for a given use (urban, industrial, agricultural, recreational or environmental), from experimental data, using quality standards.
- To plan a strategy to control polluting sources, including urban and urban-assimilable discharges, industrial discharges with hazardous substances and diffuse pollution.
- To apply and combine knowledge of water legislation and treatment technologies, to select the stages and processes that integrate a specific water treatment system (purification, potabilization, desalination and regeneration), based on initial and final quality data required.
- To size facilities that form the basis of a water treatment system (purification, potabilization, desalination and regeneration) and know the basics of facility management, including that of their by-products.

3. Syllabus

1. LEGAL FRAMEWORK

1.1. Water regulations

1.2. Hydraulic water management

2. STATUS AND QUALITY OF NATURAL WATERS

2.1. Groundwater bodies

2.2. Surface water bodies

2.3. Control of protected areas

2.4. Pressures, Impacts and Risks Analysis

3. WATER USES: QUALITY AND TREATMENT

3.1. Water for human consumption

3.2. Water for industrial use

3.3. Water for agricultural use

3.4. Waters for recreational use

3.5. Water for environmental use

4. POLLUTING SOURCES: QUALITY AND TREATMENT

4.1. Urban and assimilable wastewater

4.2. Industrial wastewater

4. Academic activities

- Master classes (TP1) 35 h.

Problem solving classes and case studies (TP2): 15 h.

Practice sessions (TP3): 7 h.

Special practice sessions (TP4): 3h corresponding to a field trip or site visit.

Tutored works (TP6): 14 h.

- Individual study (TP7). 52 h.

Personalized tutoring teacher-student 14 h.

Assessment (TP8): 10 h.

5. Assessment system

The subject will be evaluated only in the global evaluation modality by means of the following activities:

Test 1. Tutored works (70%) Assessment of the degree of compliance with the proposed objectives, the procedure developed, the quality of the reports presented and the participation in the scheduled sessions. Minimum grade to average: 4

Test 2. Practices 15% Assessment of attendance, participation and quality of reports presented. Minimum grade to average: 4

Test 3. Individual written test carried out on dates established by the centre (in 1st and 2nd call), which includes three parts:

1. Theory exam (15%). Multiple choice questions, short answer or open-ended questions related to the global topics covered in the subject. Minimum grade to average: 4
2. Case study exam (70%). Exam of practical cases similar to those addressed in the guided work. Only necessary if test 1 has not been passed.
3. Practice exam (15%). Exam of short answer or open-ended questions, related to the practices. Only necessary if test 2 has not been passed.

6. Sustainable Development Goals

6 - Clean Water and Sanitation
11 - Sustainable Cities and Communities