

Degree programme	Type	Course
Geography, Environmental Management and Regional Planning	OP	3

Contact lecturer

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Teaching staff

Begoña Martinez Lopez

Group languages

You can consult this information at the [end](#) of the document.

Prerequisites

To take this course it is recommended to have previously completed the course 'Dynamics of Water, Energy, and Natural Resources'.

To take this course, students must have a command of Catalan and/or Spanish at level B2 or higher.

Objectives

This is an elective subject that can be taken in either the 3rd or 4th year and provides continuity to the subject Dynamics of Water, Energy, and Natural Resources.

This course aims to provide students with the conceptual and practical tools for water planning and management in Mediterranean environments, in order to address hydrological challenges from both environmental and socio-economic perspectives. Specifically, it will delve into the understanding and management of the water cycle from physical, socio-economic, and systemic viewpoints. The course will offer methodologies, techniques, and tools for managing the water cycle, including water policies, flow regulation, aquifer management, energy use, irrigation systems, water collection and distribution for domestic and industrial purposes, wastewater treatment, and more.

Learning outcomes

- CM06 (Carry out team work that promotes commitment to the team, the habit of collaboration and joint problem-solving skills.) Carry out team work that promotes commitment to the team, the habit of collaboration and joint problem-solving skills.
- KM38 (Define the planning and management of the water cycle and/or energy management from a physical, socio-economic and systemic point of view.) Define the planning and management of the

- water cycle and/or energy management from a physical, socio-economic and systemic point of view.
- SM31 (Use instruments and mechanisms for the management and planning of water resources and energy resources in a specific practical case.) Use instruments and mechanisms for the management and planning of water resources and energy resources in a specific practical case.

Contents

Module 1. Introduction to the Integrated Water Cycle

- 1.1. The integrated water cycle
- 1.2. Historical and sociodemographic context
- 1.3. Mediterranean context
- 1.4. Effects of global change on river systems
- 1.5. Status of water resources
- 1.6. Water pollution
- 1.7. Water characterization

Module 2. Urban Water Cycle

- 2.1. Water supply
- 2.2. Sanitation
- 2.3. Reuse
- 2.4. Nature-based solutions
- 2.5. Water resources balance

Module 3. Application of GIS in Water Planning and Management

- 3.1. GIS applied to water planning and management
- 3.2. GIS practical session

Module 4. Ecology of Water Bodies

- 4.1. The Water Framework Directive
- 4.2. The concept of ecological status
- 4.3. Assessment of ecological status

Module 5. Economic Management of Water

Module 6. Conflicts in Water Planning and Management

6.1. Identifying the stakeholders involved

6.2. Issues, discussion, and decision-making

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Practical sessions (PAUL)	16.5	0.66	CM06, SM31
Field work	4	0.16	SM31
Information search	35	1.4	
Report	35	1.4	
Tutorials	5	0.2	
Oral speech	3	0.12	
Visit questionnaires	2	0.08	
Visits	4	0.16	KM38
Practical exercises	20	0.8	SM31
Lectures	25.5	1.02	KM38

This course will be delivered through lectures, practical activities, two site visits, and a field trip (assessment of the ecological status of a river).

Among the practical activities, one will involve the use of Geographic Information Systems (GIS).

Several sessions will focus on analyzing and proposing solutions to conflicts related to water planning and management. This part of the course will be carried out through group work, including oral presentations by students.

During the site visits and field trip, the Faculty's Field Trip Protocol will be applied. Students will have access to specific safety documentation for activities conducted off-campus, which they must read and accept.

Annotation: within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
GIS practice	15%	0	0	KM38, SM31
Project	40%	0	0	CM06, SM31
Visit questionnaires	20%	0	0	KM38

The assessment of the course will be based on the following components:

- GIS Practical (15%). A specific case will be presented to be solved using Geographic Information Systems: identifying a water body and calculating the percentages and/or surface area of its land uses and cover types. A map must be exported with a topographic base and orthophoto.
- Ecological Status Assessment (25%). A field trip will be conducted to the Besòs or Tordera river basin, where students will assess the ecological status of a specific river section. The theoretical sessions will provide the necessary tools for students to carry out their own assessment.
- Visit Questionnaires (20%). For each site visit, students must complete a questionnaire with questions related to the visit and the corresponding theoretical content.
- Group Project (40%). In groups, students must investigate a water planning and management issue, identify the main stakeholders, analyze the conflicts, and propose solutions that benefit as many parties as possible. This project will consist of an oral presentation (20%) and a written report (20%).

Submission of all activities is mandatory in order to receive a final grade.

Submission of Activities

Submissions received after the deadline set on the Virtual Campus will be marked as "Not Submitted", except in duly justified cases.

Review of Grades

The maximum deadline for providing feedback and communicating the grades of the assessment activities is three weeks.

At the time of each assessment activity, the teaching staff will inform students (via Moodle) of the procedure and date for grade review.

Resit Assessment

If two of the assessed activities have not been submitted or have been failed (score below 5), students may take a resit exam.

Students wishing to improve their grade may also take the resit; in no case will it lower their existing grade.

Assessment activities involving irregularities are not eligible for resit.

Non-Assessable Students

Students will receive a "Not Assessable" grade if they have not submitted more than 30% of the assessment activities.

Plagiarism or Fraudulent Conduct

If a student commits any irregularity that may significantly affect the grade of an assessment activity, that activity will be graded with a 0, regardless of any disciplinary action that may follow. If multiple irregularities are detected in the same course, the final grade will be 0.

Use of Artificial Intelligence

The use of Artificial Intelligence (AI) technologies is permitted in this course only as a support tool. Students must clearly identify which parts were generated using AI, specify the tools used, and include a critical reflection on how these tools influenced the process and final outcome. Lack of transparency in the use of AI will be considered academic dishonesty and may result in partial or full penalties on the activity grade, or more serious sanctions in severe cases.

Single Assessment

This course does not offer a single assessment option.

Bibliography

- Metcalf & Eddy Inc., Tchobanoglous, G., Burton, FL, Tsuchihashi, R., & Stensel, HD (2013). Ingeniería de aguas residuales: Tratamiento y recuperación de recursos (5.ª ed.). McGraw-Hill Professional.
- Ministerio para la Transición Ecológica y el Reto Demográfico. (24 de octubre de 2024). Real Decreto 1085/2024, de 22 de octubre, por el que se aprueba el Reglamento de reutilización del agua y se modifican diversos reales decretos que regulan la gestión del agua. Boletín Oficial del Estado, 255, 139159-139230 à https://www.boe.es/diario_boe/txt.php?id=BOE-A-2024-21701
- Parlamento Europeo y Consejo de la Unión Europea. (2024, 27 de noviembre). Directiva (UE) 2024/3019 del Parlamento Europeo y del Consejo sobre el tratamiento de las aguas residuales urbanas (versión refundida). Diario Oficial de la Unión Europea, L 2024/3019 à <https://eur-lex.europa.eu/legal-content/ES/ALL/?uri=CELEX:32024L3019>
- Parlamento Europeo y Consejo de la Unión Europea. (2020). Reglamento (UE) 2020/741 de 25 de mayo de 2020 relativo a los requisitos mínimos para la reutilización del agua. Diario Oficial de la Unión Europea, L 177/32, 5 de junio de 2020 à <https://www.boe.es/doue/2020/177/L00032-00055.pdf>
- Unión Europea. (1991, 21 de mayo). Directiva 91/271/CEE del Consejo, de 21 de mayo de 1991, sobre el tratamiento de las aguas residuales urbanas. Diario Oficial de las Comunidades Europeas, L 135/40 à <https://www.boe.es/buscar/doc.php?id=DOUE-L-1991-80646>
- Ministerio de Sanidad. (11 de enero de 2023). Real Decreto 3/2023, de 10 de enero, por el que se establecen los criterios técnico-sanitarios de la calidad del agua de consumo, su control y suministro. BOE núm. 9, de 11/01/2023. <https://www.boe.es/buscar/act.php?id=BOE-A-2023-628Formato>
- Harvard:España (2023). Real Decreto 3/2023... BOE, núm. 9. à <https://www.boe.es/buscar/doc.php?id=BOE-A-2023-628>
- Crittenden, J. C., Trussell, R. R., Hand, D. W., Howe, K. J., & Tchobanoglous, G. (2012). MWH's Water Treatment: Principles and Design (3rd ed.). Hoboken, NJ: John Wiley & Sons.

Software

Office and GIS software.

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	1	Catalan	second semester	morning-mixed
(PAUL) Classroom practices	1	Catalan	second semester	morning-mixed
(PCAM) Field practices	1	Catalan	second semester	morning-mixed