

**COURSE DATA****Data Subject**

Code	43053
Name	Water quality and ecological status of inland aquatic ecosystems
Cycle	Master's degree
ECTS Credits	4.0
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. year	Period
2139 - M.U. en Contaminación, Toxicología y Sanidad Ambient. 12-V.2	Faculty of Biological Sciences	1	Second term

Subject-matter

Degree	Subject-matter	Character
2139 - M.U. en Contaminación, Toxicología y Sanidad Ambient. 12-V.2	2 - Environmental pollution	Optional

Coordination

Name	Department
ANDREU SANCHEZ, OSCAR ENRIQUE	25 - Plant Biology
CAMACHO GONZALEZ, ANTONIO	275 - Microbiology and Ecology

SUMMARY

The subject "Water quality and ecological status of aquatic ecosystems" aims to provide students with theoretical and practical knowledge to enable them to assess problems regarding to water pollution or any other affecting aquatic ecosystems. It also provides knowledge and capacities for the assessment of ecological status of these ecosystems in the light of the Water Framework Directive (2000/60/EC) and, referring to the conservation of natural habitats, the habitats Directive (92/43 / EEC) as well as legislation and programs of measures associated with the implementation of both policies in Spain and the European Union.



PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

OUTCOMES

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- Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.
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- Capacidad de análisis, síntesis y razonamiento crítico en la aplicación del método científico.
- Capacidad para el aprendizaje autónomo y organizado y para la adaptación a nuevas situaciones.
- Comprensión del mundo natural como producto de la evolución y de su vulnerabilidad frente a la influencia humana.
- Desarrollo de un compromiso ético y capacidad de participación en el debate social.
- Valorar integralmente del estado de salud del medio ambiente.
- Saber catalogar y evaluar recursos biológicos.
- Conocer la estructura y dinámica de las poblaciones.
- Evaluar el estado ecológico de los ecosistemas acuáticos epicontinentales.
- Interpretar el paisaje y restaurar hábitats.
- Planificar la explotación racional de los recursos naturales renovables terrestres y acuáticos.
- Evaluar la calidad de aguas.
- Comprender e interpretar los procesos de contaminación de las aguas y sus efectos.

LEARNING OUTCOMES



SKILLS TO ACQUIRE.

- To handle scientific terminology properly and become familiar with their sources.
To get an integrated view of the defense mechanisms of adaptation to the environment of animals.
Make sense of foreground, interrelate and apply.
- Ability to analyze data, choosing the right method, critical evaluation and interpretation of experimental results in various forms of expression (tables, graphs ...).
- Acquire synthesis capacity to collect, coherently and in an organized way, information or data of different origins.
- Meet the management of basic scientific instrumentation typical of Water Quality assessment

SOCIAL SKILLS

- Develop capacity for critical thinking, fostering communication and discussion with a view to stimulating individual creative ability.
- Ability to work in groups when dealing with problematic situations collectively.
- Ability to build a comprehensive text written and organized.
- Ability to speaking to a public audience, such as the class itself, by exposure or intervention in a debate on a topic or controversial issue.
- Ability to interact with both the teacher and with peers.
- Interest in social and economic application of science and in particular the Environmental Toxicology.
- Interest in popular science and the impact of science on culture and consciousness of society.
- Professional training. Acquisition of scientific and technical knowledge related to resistance to xenobiotics that will facilitate the work in ecology and water quality assessment in a society in continuous technological progress.

DESCRIPTION OF CONTENTS

1. THEORYCAL LESSONS

- 1.- Introduction: The water: physical properties and water cycle. Hydrological regime of aquatic ecosystems. Aquifers.
- 2.- Water Framework Directive. Other European Directives that affect aquatic ecosystems.
- 3.- Water Planning. Impacts on quality and quantity of water and aquatic ecosystems.
- 4.- Pollution of aquatic systems: concepts. Bioaccumulation in food webs. Matrices: water, sediments and biota.
- 5.- Pollution processes and their effects on aquatic ecosystems. Eutrophication, acidification, heavy metals, faecal contamination, xenobiotics and complex organic compounds. Causes, effects, evaluation and solutions. Other types of pollutants, thermal pollution, radiation, etc.



- 6.- Evaluation of pollution. Physical-chemical indicators and methods of determination.
- 7.- Biological indicators and methods of determination
- 8.- Regulations on water quality and aquatic ecosystem health.
- 9 Monitoring. Control networks.
- 10.- Assessment of ecological status (DMA) and condition (DH)
- 11.- Measures mitigation of pollution of aquatic ecosystems. Restoration of a aquatic ecosystems
- 12.- Water quality and aquatic ecosystems in private companies and the water adminsitration

2. PRACTICAL SESSIONS

1. Field trip for sampling of biological and physical-chemical variables in locations (rivers and lagoons) with different pollution levels.
2. Laboratory/Practical lessons for the biological, microbiological and physical-chemical analyses
3. Office work and sharing: Evaluation of water quality and ecological status.

WORKLOAD

ACTIVITY	Hours	% To be attended
Laboratory practices	25,00	100
Theory classes	15,00	100
Development of individual work	5,00	0
Study and independent work	15,00	0
Preparation of evaluation activities	10,00	0
Preparing lectures	10,00	0
TOTAL	80,00	

TEACHING METHODOLOGY

- Master classes for acquiring the fundamental knowledge, including methodological aspects.
- Practice class on the evaluation of pollution effects.
- Students will work in groups (of 2 or 3 people) on specific subjects proposed by the lecturer, finally showing their results in an oral presentation to the rest of the class.
- A tutorship of 1.5 hours will be carry out in the class. On the other hand, other tutored sessions will



be available by e-mail or using the “aula virtual” tool.

- All activities and master classes are reinforced with documentation and information exchanges between lecturers and students using the “aula virtual” tool of the Universitat de València webpage.

EVALUATION

Written exams on everything seen in the theoretical and practical classes: based on the learning outcomes and the specific objectives of the course, this part has a weight of 60% of the final grade. The minimum grade that can be compensated with the practical part is set at 4.0 out of 10.

Elaboration of an internship report that includes the work carried out during the field and laboratory sessions, including a critical discussion of the results obtained during them. This part has a weight of 40% of the final grade. Attendance to at least 80% of the sessions is compulsory. The minimum grade that can be compensated with the theory part is 4.0 out of 10.

Recovery of the theoretical part: There will only be one recovery of the theoretical part, corresponding to the 2nd official convocation of the subject, to which the students who failed or did not present all in the first exam will be able to present themselves.

REFERENCES

Basic

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Additional

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