VNIVERSITAT DE VALÈNCIA

Course Guide
43273 Impacts on the aquatic environment

COURSE DATA

Data Subject	
Code	43273
Name	Impacts on the aquatic environment
Cycle	Master's degree
ECTS Credits	3.0
Academic year	2021 - 2022

Study (s)

Degree	Center	Acad. year	Period
2148 - M.D. in Biodiversity: Conservation and Evolution	Faculty of Biological Sciences	1	First term

Subject-matter

Degree	Subject-matter	Character
2148 - M.D. in Biodiversity: Conservation and Evolution	11 - Protection of the diversity of ecosystems	Optional

Coordination

Name	Department
GARCIA ROGER, EDUARDO MOISES	275 - Microbiology and Ecology

SUMMARY

"Impacts on the Aquatic Environment" aims to provide students with knowledge to assess the problems, especially in terms of the alteration of the aquatic environment, pollution and water scarcity, which can affect aquatic continental (rivers, lakes, reservoirs, tidal flats, reservoirs, marshes) and marine ecosystems, promoting a critical behavior towards the irrational use of water and non respectful activities regarding its quality, that favors a sustainable use of this resource compatible with the conservation of the aquatic ecosystems.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

Previous knowledge on Biology is recommended, including basic Ecology (from the grade in Biology, Environmental Sciences or equivalent). Theoretical and applied knowledge of other disciplines is also required, especially Water Chemistry, and to a lesser extent Physics.

OUTCOMES

2148 - M.D. in Biodiversity: Conservation and Evolution

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.
- Students should demonstrate self-directed learning skills for continued academic growth.
- To acquire basic skills to develop laboratory work in biomedical research.
- Be able to access the information required (databases, scientific articles, etc.) and to interpret and use it sensibly.
- Stimulate the capacity for critical reasoning and for argumentation based on rational criteria.
- Favour intellectual curiosity and encourage responsibility for one's own learning.

LEARNING OUTCOMES

- To know the aquatic areas likely to be protected. Capacity to choose and design the areas to be protected.

- To identify the key quality indicator organisms and design areas to be protected.

- To know the physicochemical and organic elements that affect the aquatic environment.

- To manage disturbances and seek solutions to reduce and, if necessary, eliminate their harmful effects.

Objectives:

1. Training for the knowledge of natural aquatic areas.

2. Training to recognize human alterations to the environment.

3. Training for the contribution of solutions for environmental recovery.

DESCRIPTION OF CONTENTS

1. Water as a resource

Physical properties and the cycle of water. Water as a resource, sustainable planning of water use. Control of demand in the face of increasing supply. Provision, renewal and regulation of surface water use. Exploitation of aquifers. Autonomy in water use (desalination, water reuse). Water saving solutions in agriculture, industry and cities. Reforestation as a measure to maintain water resources.

2. Water pollution

Water pollution. Pollutants. Pollution sources.

3. Effects of water pollution

Effects on individual organisms: toxicity assays, effects on metabolism, effects on physiology and interactive effects of pollutants. Effects on populations: effects on population dynamics and evolution of resistance to contamination. Effects on communities and ecosystems.

4. Use of ecological status indices in rivers in the context of the Water Framework Directive

The Water Framework Directive. Typological classification of rivers. Criteria for the selection of reference sites and definition of reference conditions. Indexes for the study of the ecological status of rivers: organisms used, unimetric indexes, multimetric indexes. EQR values and intercalibration exercises. Establishment of quality classes.

5. Ecological status indicators in ponds, lakes and reservoirs

Ponds and lakes in the context of the Water Framework Directive. Typological classification of ponds and lakes. Criteria for the selection of reference sites and definition of reference conditions. Indexes for the study of the ecological status in ponds and lakes.

6. Ecological status indicators in marine environments

The marine environment. Types of indicators: environmental and habitat indicators, indicators based on ecological strategies, indicators based on key species, indicators based on size, trophodynamic indicators. Network analysis. Examples.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	20,00	100
Laboratory practices	10,00	100
Attendance at events and external activities	5,00	0
Development of group work	5,00	0
Study and independent work	10,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	5,00	0
Preparation of practical classes and problem	5,00	0
Resolution of case studies	5,00	0
Resolution of online questionnaires	5,00	0
TOTAL	**75,00**	

TEACHING METHODOLOGY

- Master classes, held in the classroom.

- Oral expositions on specific topics and their participative discussion by the whole group.

- Laboratory classes, with emphasis on the most common methods and techniques.

EVALUATION

- Continuous evaluation of the activity performed by the student (participative attendance, handling of material, equipment, organization of work).

- Exams (written or oral) based on the learning results and the specific objectives of each subject in its theoretical part.

- Exams (written or oral) based on the learning results and the specific objectives of each subject in the practical part.

REFERENCES

Basic

- Andreu, E. & A. Camacho. 2002. Recomendaciones para la toma de muestras de agua, sedimentos y biota en humedales Ramsar. Dirección General de Conservación de la Naturaleza, Ministerio de Medio Ambiente. Madrid.
- APHA - AWWA WEF. 1992. Standard methods for the examination of water and wastewater. 18th edition. American Public Health Association. Washington D.C., 1100 pp.
- Dodds W. K. 2003. Freshwater Ecology. Academic Press.
- Kalff, J. 2002. Limnology. Prentice Hall. 592 pp.
- Maitland P.S. & N.C. Morgan 1997. Conservation and management of freshwater habitats: lakes, rivers and wetlands. Chapman & Hall-Kluwer. New York.
- Mason , C. 2001. Biology of Freshwater Pollution. Prentice Hall.
- Wetzel, C. 2001. Limnology. Elsevier.
- Wetzel R.G. & Likens G.E. 2000. Limnological analyses. Springer-Verlag, New York.

Additional

- Directiva 2000/60/CE del Parlamento Europeo y del Consejo, de 23 de octubre de 2000, por la que se establece un marco comunitario de actuación en el ámbito de la política de aguas (Directiva Marco del Agua)
- REAL DECRETO LEGISLATIVO 1/2001, de 20 de julio, por el que se aprueba el Texto Refundido de la Ley de Aguas
- Legislación Europea (Directivas), Española y Autonómica sobre el Medio Ambiente, vertidos, residuos y calidad de las aguas y del medio acuático.

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

English version is not available

Contenidos:

Se mantienen los contenidos inicialmente recogidos en la Guía Docente.

Volumen de trabajo y planificación temporal de la docencia:

El volumen de trabajo no cambia. Las actividades a realizar son básicamente las especificadas en la Guía de la asignatura. Se mantiene la programación temporal de materiales docentes puestos a disposición del alumnado, de acuerdo con el calendario académico, pero se les da libertad de estudiarlos según su propio criterio y posibilidades. Algunas tareas podrán tener plazo de presentación, para facilitar su evaluación.

Metodología docente:

Adaptable según el grado de presencialidad.

(a) Clases de teoría: En caso de no presencialidad, todas las sesiones se sustituirán por archivos de vídeo y/o lecciones locutadas puestos a disposición del alumnado a través de Aula Virtual para sustituir la lección magistral. Se realizarán ejercicios y cuestionarios on line, asistidos con la aplicación chat de Aula virtual.

(b) Tutorías individuales: Por correo electrónico, ampliando la disponibilidad horario del profesor. Excepcionalmente, por videoconferencia a través de conexión online con Blackboard Collaborate (BBC).

(c) Prácticas de laboratorio: En caso de no presencialidad, se sustituyen por sesiones a distancia donde se analizarán datos similares a los que se habrían obtenido en el laboratorio. Se facilitarán guiones adaptados para las prácticas.

(d) Prácticas de campo: En caso de no presencialidad, se sustituyen por estudios de casos prácticos guiados por el profesor. La documentación se subirá a Aula Virtual en forma de archivos pdf (distintos para distintos grupos de trabajo fromados por los estudiantes), que se complementarán con material audiovisual subido a aula virtual.

Evaluación:

Se mantiene el peso de las distintas actividades evaluables. Las tareas podrán tener plazo de presentación, para facilitar su evaluación (con un peso de hasta el 20% de la calificación final). Los trabajos individuales de seminario se evaluarán a distancia, pudiéndose presentar a través de videoconferencia (con un peso de hasta el 30% de la calificación final). En caso de no poder realizarse el examen escrito en esta modalidad (con un peso de hasta el 50% de la calificación final), se realizará en línea, con tiempo limitado a través del módulo cuestionarios del Aula Virtual, en función de las posibilidades técnicas. Si por causas técnicas, debidamente justificadas, algún estudiante no puede realizar algún examen, se estudiará la posibilidad de realizar una prueba alternativa que, en todo caso, será de tipo interactivo (combinando parte oral y escrita).

Bibliografía:

Se mantiene la bibliografía recogida inicialmente en la Guía Docente.