COURSE DATA

DATA SUBJECT

Code: 47083
Name: Contaminant Processes
Cycle: Master's Degree
ECTS Credits: 6.5
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
2285 - Máster Universitario en Contaminación Ambiental y Ecotoxicología	Facultat de Ciències Biològiques	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2285 - Máster Universitario en Contaminación Ambiental y Ecotoxicología	Procesos contaminantes y sus efectos	COMPULSORY

COORDINATION

ESTELLES LEAL VICTOR

BOLUDA HERNANDEZ RAFAEL

RENAU PRUÑONOSA ARIANNA

SUMMARY

This subject addresses in a multidisciplinary way the polluting processes that occur in the environment and that affect human health. It is a compulsory subject that is taught in the first semester. It consists of 5 differentiated blocks, taking into account the different processes that are identified in the atmosphere, in the soils, in continental and marine aquatic ecosystems, as well as in human beings. The subject is taught by teachers specialised in each of the subjects.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

No restrictions have been specified with other subjects in the curriculum.

COMPETENCES / LEARNING OUTCOMES

2285 - Máster Universitario en Contaminación Ambiental y Ecotoxicología

Collaborate effectively in work teams, taking on responsibilities and leadership roles and contributing to collective improvement and development.

Demonstrate critical and self-critical reasoning in the field of the degree, considering aspects such as professional ethics, moral value and the social implications of the different activities carried out.

Develop and implement programmes and projects to prevent, control and mitigate environmental pollution.

Develop the ability to work in multidisciplinary teams and to cooperate effectively.

Develop the capacity for analysis, synthesis and critical thinking in applying the scientific method.

Diagnose environmental problems.

Evaluate and assess the impact of human activities on pollution in the atmosphere, inland waters, marine waters and soils.

Evaluate the behaviour of pollutants and their interactions in different environmental compartments.

Evaluate the quality of water and soil.

Know how to apply epidemiological principles and methods in relation to environmental pollution.

Learn how to write scientific articles in the fields of environmental pollution and ecotoxicology.

Understand and interpret the processes of atmospheric, aquatic and soil pollution and their effects.

Understand the natural world as a product of evolution and its vulnerability to human influence.

Understand the nature of different environmental matrices, their components and aspects related to their degradation, resilience and health.

Understand the processes responsible for groundwater dynamics.

Use different bibliographic sources and biological databases.

DESCRIPTION OF CONTENTS

Block 1. Polluting processes in the atmosphere.

- The Earth's atmosphere: origin, composition and structure.
- Gaseous pollutants.
- Particulate pollutants.
- Pollutant dispersion models.
- Noise pollution.

Block 2. Polluting processes in the oceans

- Introduction to Physical Oceanography
- Introduction to Chemical Oceanography
- Heavy Metal Pollution in Marine Ecosystems
- Plastic Pollution in Marine Ecosystems
- Sampling Methodology in Oceanography

Block 3. Polluting Processes in Inland Waters

- Dynamics of inland waters (groundwater and surface water) and their interaction with associated continental geological systems
- Geological systems as receptors of pollution
- Fundamentals of hydrogeology and hydrogeochemistry. Contaminant transport
- Attenuation processes
- Common contaminants in geological systems. Case studies

Block 4. Contaminating processes in soils.

- Soil degradation and contamination processes.
- Nature, soil properties and degradation processes.
- Models of the physical behaviour of the soil.
- Strategies against soil contamination.

Block 5. Polluting processes in human health and environmental epidemiology

- Main polluting processes that affect human health.
- Sources of exposure to environmental pollutants.
- Methods of environmental epidemiology to study health effects.
- Analysis of real cases and environmental impact studies on public health.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	50,00
Computer classroom practice	9,00
Classroom practices	6,00
Total hours	**65,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	5,00
Individual or group project	15,00
Independent study and work	30,00
Preparation of lessons	10,00
Preparation for assessment activities	30,00
Resolution of case studies	7,50
Total hours	**97,50**

TEACHING METHODOLOGY

It is based on the following teaching methods:

- In-person master classes on theory and problems, in which the fundamental knowledge and methods are taught.
- In-person laboratory, computer or field trips, in which the methods developed in the master lectures are put into practice.
- Seminars, conferences (optional). The Virtual Classroom made available by the Universitat de València will be used for the delivery of teaching materials, delivery of student assignments, and communication between teaching staff and students.

EVALUATION

SE1 - Continuous evaluation of the student in theory, laboratory, field, problem class, computer science and seminar classes: participation, manipulation of material and equipment, organisation of work, understanding and use of the practice materials, teamwork, etc.

SE2 - Evaluation of non in-person activities related to laboratory, field, problem class, computer classes: reports and/or reports of the practices delivered.

SE3 - Written exams on theoretical and/or practical classes: based on the learning outcomes and the specific objectives of each subject.

SE4 - Attendance at tutorials for the completion of the work and/or participatory attendance at course(s), seminar(s) programmed for the promotion of transversal competences. Preparation of reports.

The percentage of each evaluation method will be as follows:

SE1: 20%

SE2: 25%

SE3: 50%

SE4: 5%

The exam will also consist of 5 different blocks. The final grade will be obtained as a weighted average of the grades of the different blocks, as follows:

Block 1. Pollutant processes in the atmosphere: 25%

Block 2. Polluting processes in seas and oceans: 20%

Block 3. Polluting processes in inland waters: 20%

Block 4. Contaminant processes in soils: 25%

Block 5. Polluting processes in human health: 10%

In order to pass, the grade thus obtained must be at least 5 out of 10.

REFERENCES

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- Baker, D., Kjellström, T., Calderón, R., Pastides, H., & World Health Organization, Occupational and Environmental Health Team (Eds.). (1999). Environmental epidemiology: A textbook on study methods and public health applications (Preliminary ed.; WHO/SDE/OEH/99.7). World Health Organization.

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