



COURSE DATA

DATA SUBJECT

Code: 45003

Name: Environmental Evaluation and Management Tools

Cycle: Master's Degree

ECTS Credits: 4.5

Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
2250 - Master's Degree in Environmental Engineering	Escola Tècnica Superior d'Enginyeria	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2250 - Master's Degree in Environmental Engineering	Herramientas de evaluación y gestión ambiental	COMPULSORY

COORDINATION

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SUMMARY

Professors UPV: Inmaculada Romero Gil

Environmental assessment and management tools is a compulsory subject of 4.5 ECTS that is taught in the first semester of the first year of the Master's Degree in Environmental Engineering.

This subject aims to sensitize the student about the need to study, anticipate, evaluate and properly manage the consequences that human actions have on the environment, understood in a broad sense.

Therefore, the subject is designed to provide the student with the necessary knowledge to develop decision-making tools, analysis, prevention and mitigation / compensation of environmental damage caused by human activities, thereby allowing a compatible development with the maintenance of environmental quality. Logically, all this implies the need to provide the necessary knowledge to use and / or structure the different environmental assessment and management tools: environmental impact assessment, environmental risk assessment, life cycle analysis, eco-design, environmental management systems, and integrated management systems.



Obviously, this entire subject, and in particular the practical applications derived from the contents, are related to the 2030 agenda and various SDGs. E in particular: 6 Water, 7 Energy, 9 Industry, 11 Cities, 12 Production, 13 Climate, 14 Underwater life, 15 Terrestrial ecosystems.

This course allows students to receive basic training in concepts, regulations, methods and tools for the management of ecosystems that may be affected by any type of project, work or activity. It will allow them to adapt within this field in an interdisciplinary, complex and dynamic work environment.

This subject is necessary and indispensable in the professional field of future environmental engineers, since in order to define the chosen alternative of a specific project, it is necessary to anticipate and assess the environmental effects of the different project options. Based on the environmental evaluation, the alternative that generates fewer environmental effects may be chosen. Once the activity has been defined and launched, other necessary and essential environmental assessment and management tools come into play.

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 are contemplated.

COMPETENCES / LEARNING OUTCOMES

2250 - Master's Degree in Environmental Engineering

Apply tools for environmental assessment and management including environmental impact assessment and environmental risk assessment.

Develop environmental solutions under the principles of circular economy and the sustainable development goals.

Identify, formulate and solve complex environmental engineering problems by applying engineering, scientific and mathematical principles.

Implement measures for preventing pollution and recovering, protecting and improving environmental quality.

Interpret and apply national and international environmental legislation and adapt environmental solutions to these regulations.

Learn and apply new knowledge, using appropriate learning strategies.

Recognise the ethical and professional responsibilities of environmental engineering and make informed judgements considering the impact of engineering solutions in global, economic, environmental and social



contexts.

Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.

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 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.

Students should possess and understand foundational knowledge that enables original thinking and research in the field.

Work in a team effectively and with leadership, in a collaborative and inclusive environment, setting goals, planning tasks and meeting objectives.

DESCRIPTION OF CONTENTS

1. Introduction. Environmental management tools

Introduction to environmental management. Examples of environmental management tools: environmental impact assessment, environmental audits, clean production and best available techniques, eco-labelling, ecological marketing.

2. Environmental evaluation

Basic concepts of Environmental Assessment and Environmental Impact Assessment. Justification of the need to study the environmental impact that a civil work can generate prior to its design, installation and operation. European, state and regional regulations.

3. Environmental impact studies

Administrative procedure of the Environmental Impact Assessment. Sections of an Environmental Impact Study and its determining aspects. Description of the project and Alternatives. Environmental Inventory.

4. Assessment and Mitigation and Correction of Environmental Impacts

Environmental effects and their valuation. Protective, mitigating, restorative measures. Environmental Surveillance Plan. Synthesis Document.



5. Environmental management systems

SGM Models: ISO14001. SGM implementation. Integration with other management systems in the company, quality and prevention of labor risks: Integrated management system.

6. Environmental Risk Assessment

Analysis and evaluation of risks when exposed to substances. Models for exposure assessment. Models for evaluating persistence. Characterization of environmental risk. Measures to reduce environmental risk.

7. Life cycle analysis. Ecodesign

Life Cycle Analysis Methodology. Application of characterization methods. Computer tool for Life Cycle Analysis. Selection and application of databases. Environmental Footprints. Eco-design.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	13,00
Theoretical and practical classes	2,00
Seminar	5,00
Computer classroom practice	12,00
Classroom practices	13,00
Total hours	45,00

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	16,00
Independent study and work	20,00
Preparation of lessons	8,50
Preparation for assessment activities	10,00
Resolution of case studies	13,00
Total hours	67,50

TEACHING METHODOLOGY

Actividades teóricas:

Desarrollo expositivo de la materia con la participación del estudiantado en la resolución de cuestiones



puntuales, proporcionando una visión global e integradora, analizando con mayor detalle los aspectos clave y de mayor complejidad.

Actividades prácticas:

Aprendizaje mediante resolución de problemas, ejercicios y casos de estudio a través de los cuales se adquieren competencias sobre los diferentes aspectos de la materia. Comprenden los siguientes tipos de actividades presenciales:

- Clases de problemas y cuestiones en aula
- Sesiones de discusión y resolución de problemas y ejercicios previamente trabajados por los/las estudiantes
- Realización de cuestionarios individuales de evaluación en el aula con la presencia del profesor/a

Actividades en aula informática:

Aprendizaje mediante la realización de actividades desarrolladas de forma individual o en grupos reducidos y llevadas a cabo en aulas de ordenador.

Trabajo personal del estudiantado.

Realización (fuera del aula) de trabajos monográficos, búsqueda bibliográfica dirigida,

cuestiones y problemas, casos de estudio, así como la preparación de clases y exámenes (estudio). Esta tarea se realizará de manera individual e intenta potenciar el trabajo autónomo.

Trabajo en pequeños grupos:

Realización, por parte de pequeños grupos de estudiantes (2-4) de trabajos, cuestiones, problemas y casos de estudio fuera del aula. Esta tarea complementa el trabajo individual y fomenta la capacidad de



integración en grupos de trabajo.

EVALUATION

There will be 2 objective tests to assess the understanding and acquisition of the theoretical knowledge acquired throughout the course (30% of the final mark).

For the practical part (65% of the final mark), a project will be carried out as the theoretical part is taught (40%) and the delivery of practical cases (25%).

In addition, participation in the different activities and planned tasks will be continuously assessed (5%).

In order to pass, students will have to obtain a mark equal to or higher than 4.0 in each of the tests and assignments. If this is not the case, there will be a remedial test for the part not passed in the period reserved for the remedial phase.

The copy or plagiarism of any activity that is part of the evaluation will mean the impossibility of passing the subject, being subsequently subjected to the appropriate disciplinary procedures indicated in the PROTOCOL OF ACTION AGAINST FRAUDULENT PRACTICES AT THE UNIVERSITAT DE VALÈNCIA (ACGUV 123/2020).

In any case, the evaluation system will be governed by the provisions of the Regulation of evaluation and grading of the University of Valencia for bachelor's and master's degrees (ACGUV 108/2017).

REFERENCES



- Introducción a la evaluación de impacto ambiental (Romero Gil, Inmaculada)
- Metodologías de valoración de impactos (Romero Gil, Inmaculada)
- Medidas y programas de vigilancia ambiental en la evaluación de impacto ambiental (Romero Gil, Inmaculada)
- Evaluación ambiental (Borderías Uribeondo, María Pilar)
- Casos prácticos en evaluación de impacto ambiental (Martínez Orozco, Juan M./Asociación española de evaluación de impacto ambiental)
- Green Engineering: Environmentally Conscious Design of Chemical Processes. David T. Allen, David R. Shonnard (Prentice Hall; 2001)
- Toxicología ambiental. Evaluación de riesgos y restauración ambiental (Carlos E. Peña, Dean E. Carter, Félix Ayala-Fierro)
- Análisis de ciclo de vida: aspectos metodológicos y casos prácticos (Gabriela Clemente, Neus Sanjuán y José Luis Vivancos).
- Ecodiseño. Ingeniería del ciclo de vida para el desarrollo de productos sostenibles. Salvador Capuz Rizo y Tomás Gómez Navarro. (Universidad Politécnica de Valencia, 2002)
- Feijoo, G., Hospido, A. y Moreira, M.T. (2007). Análisis de Ciclo de Vida (I): Desarrollo Sostenible y ACV. Ingeniería Química 443:153-161. ISSN: 0210-2064
- Feijoo, G., Hospido, A., Gallego, A., Rivela, B. y Moreira, M.T. (2007). Análisis de Ciclo de Vida (II): Metodología y Etapas. Ingeniería Química 444:114-125. ISSN: 0210-2064
- Handbook of environmental impact assessment. Volume 1, Environmental impact assessment: process, methods and potential (Petts, Judith)
- Handbook of environmental impact assessment. Volume 2, Environmental impact assessment in practice: impact and limitations (Petts, Judith)