COURSE DATA

Data Subject

Code	45003
Name	Herramientas de evaluación y gestión ambiental
Cycle	Master's degree
ECTS Credits	4.5
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
2250 - M.D. in Environmental Engineering	School of Engineering	1	First term

Subject-matter

Degree	Subject-matter	Character
2250 - M.D. in Environmental Engineering	18 - Herramientas de evaluación y gestión ambiental	Obligatory

Coordination

Name	Department
ROBLES MARTINEZ, ANGEL	245 - Chemical Engineering

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.

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.

OUTCOMES

2250 - M.D. in Environmental Engineering

- 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.
- Identify, formulate and solve complex environmental engineering problems by applying engineering, scientific and mathematical principles.
- 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.
- Work in a team effectively and with leadership, in a collaborative and inclusive environment, setting goals, planning tasks and meeting objectives.
- Learn and apply new knowledge, using appropriate learning strategies.

- 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.
- 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.

LEARNING OUTCOMES

1. Establish and justify the need to carry out Environmental Impact Assessments for certain projects.

2. Distinguish the different sections of an Environmental Impact Study and analyze the determining aspects of said sections.

3. Compile the most important aspects of the project from the environmental point of view and determine the general environmental issues and their importance.

4. Differentiate and apply the different methods to identify and assess environmental impacts.

5. Differentiate the types of measures that can be defined in the Environmental Impact Studies and review the most common measures in mitigating and correcting the environmental impacts of projects.

6. Interpret and organize an Environmental Surveillance Plan.

7. Understand what the environmental risk assessment is and what it consists of.

8. Be able to carry out environmental risk assessments for simple cases.

9. Understand what life cycle analysis and ecodesign is and what it consists of.

10. Be able to perform life cycle analysis through the use of specialized software

11. Understand what an environmental management system and an integrated management system are and what it consists of.

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 Risk Assessment

Analysis and evaluation of risks from exposure to substances. Models for exposure assessment. Models for the evaluation of persistence. Environmental risk characterization. Measures to reduce environmental risk.

6. Life cycle assessment. Ecodesign

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

7. Environmental management systems

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

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	15,00	100
Classroom practices	14,00	100
Computer classroom practice	12,00	100
Seminars	3,00	100
Theoretical and practical classes	1,00	100
Development of group work	6,00	0
Development of individual work	10,00	0
Study and independent work	10,00	0
Readings supplementary material	10,00	0
Preparation of evaluation activities	5,00	0
Preparing lectures	6,50	0
Preparation of practical classes and problem	2,00	0
Resolution of case studies	13,00	0
Resolution of online questionnaires	5,00	0
TOTAL	**112,50**	

TEACHING METHODOLOGY

English version is not available

EVALUATION

Two objective tests will be carried out to evaluate the comprehension and acquisition of the theoretical knowledge acquired throughout the course (30% of the final grade).

For the practical part (65% of the final grade), the completion of a Project is scheduled, which will be carried out as the theoretical part is taught (40%) and the delivery of the reports of the practical cases (25%).

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

In order to pass, the student will have to obtain a grade equal to or greater than 4.5 in each of the tests and assignments, otherwise a recovery test will be carried out for the part not passed in the period reserved for the recovery phase. To pass the course, the student must obtain an average grade equal to or greater than 5.

REFERENCES

Basic

- Referència b1: Introducción a la evaluación de impacto ambiental (Romero Gil, Inmaculada)
  Referència b2: Metodologías de valoración de impactos (Romero Gil, Inmaculada)
  Referència b3: Medidas y programas de vigilancia ambiental en la evaluación de impacto ambiental (Romero Gil, Inmaculada)
  Referència b4: El estudio de impacto ambiental : una introducción (Martín Cantarino, Carlos)c
  Referència b5: Green Engineering: Environmentally Conscious Design of Chemical Processes. David T. Allen, David R. Shonnard (Prentice Hall; 2001)
  Referència b6: Cómo implantar un sistema de gestión ambiental según la norma ISO 14001:2004, J.Granero Castro, M. Ferrando Sánchez (Fundación Confemetal, 2007)
  Referència b7: Análisis del Ciclo de Vida: Aspectos Metodológicos y Casos Prácticos. Gabriela Clemente, Neus Sanjuán y José Luis Vivancos. (Universidad Politécnica de Valencia, 2005)

Additional

- Referència c1: Handbook of environmental impact assessment. Volume 1, Environmental impact assessment : process, methods and potential (Petts, Judith)
  Referència c2: Handbook of environmental impact assessment. Volume 2, Environmental impact assessment in practice : impact and limitations (Petts, Judith)
  Referència c3: Toxicología Ambiental. Evaluación de Riesgos y Restauración Ambiental, Carlos E. Peña, Dean E. Carter, Felix Ayala-Fierro (University of Arizona)v
  Referència c4: Ecodiseño. Ingeniería del ciclo de vida para el desarrollo de productos sostenibles. Salvador Capuz Rizo y Tomás Gómez Navarro. (Universidad Politécnica de Valencia, 2002)