

Academic Year/course: 2022/23

25230 - Environmental impact assessment

Syllabus Information

Academic Year: 2022/23

Subject: 25230 - Environmental impact assessment

Faculty / School: 201 - Escuela Politécnica Superior

Degree: 277 - Degree in Environmental Sciences

571 - Degree in Environmental Sciences

ECTS: 6.0

Year: 4

Semester: First Four-month period

Subject Type: Compulsory

Module:

1. General information

1.1. Aims of the course

The course and its expected results respond to the following approaches and objectives:

The methodology of Environmental Impact Assessment is one of the most characteristic of Environmental Sciences. Among the objectives of the course are the knowledge of the regulations and the methods and techniques available, so that the student acquires the ability to approach the realization of an impact assessment. Given the open and partially subjective nature of the methodology, the course will also address the non-technical circumstances involved in the practice of this discipline.

These approaches and objectives are aligned with some of the Sustainable Development Goals, SDGs, of the 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>) and certain specific targets, contributing to some extent to their achievement:

- Goal 4: Ensure inclusive, equitable and quality education and promote lifelong learning opportunities for all
 - Target 4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and the contribution of culture to sustainable development
- Goal 9: Industry, innovation, and infrastructure
 - Target 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, using resources more efficiently and promoting the adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.
- Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss
 - Target 15.2 By 2020, promote sustainable management of all types of forests, halt deforestation, restore degraded forests and increase afforestation and reforestation globally
 - Target 15.4 By 2030, ensure the conservation of mountain ecosystems, including their biological diversity, to enhance their capacity to provide essential benefits for sustainable development
 - Target 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect endangered species and prevent their extinction

1.2. Context and importance of this course in the degree

The Environmental Impact Assessment course is included in Module 2 of Environmental Assessment, which directly addresses one of the four competencies to be acquired by the student: "Consulting and assessment of environmental impact and natural risks". Within Module 2, it is the reference subject.

1.3. Recommendations to take this course

As this is a subject of the specific module of "Environmental Assessment", it is required to have consolidated the knowledge of the basic modules ("Interpretation of the environment as a system" and "Instrumental knowledge"), as well as to have taken or to be taking the compulsory subjects of its module.

2. Learning goals

2.1. Competences

Upon passing the course, the student will be more competent to...

Specific competences:

- CE1. Ability to interpret the environment as a complex system: identification of the factors, processes, and interactions that configure any type of environment. This involves fundamental knowledge of all systems (hydrology, edaphology, meteorology and climatology, zoology, botany, geology, society, and territory, etc.), understanding their constitution, and fundamental processes (physics, chemistry, and biology) and their interactions (ecology).
- CE2. Capacity for a multidisciplinary analysis of the indicators and evidence of an environmental problem or situation, with capacity for qualitative and quantitative interpretation of data from different specialties, ability to relate the analysis with theoretical models, and awareness of the temporal and spatial dimensions of the environmental processes involved.
- CE3. Mastery of the procedures, languages, and techniques necessary for the interpretation, analysis, and evaluation of the environment. This implies knowledge of mathematical foundations, statistical procedures, and programs, cartography, and geographic information systems, instrumental analysis systems in the environment, or bases of environmental engineering.
- CE4. Ability to evaluate the resources and constituents of the environment in economic, social, legal, and ecological terms. This includes knowledge of economics and legislation.
- CE5. Competence to prepare a diagnosis of the environmental situation in a given context, natural, rural, or urban, based on the interpretation of all the systems of the environment, the analysis of all the relevant indicators of the situation, the valuation of its resources and constituents and the consideration of the foreseeable impacts or changes.
- CE6. Ability to prospectively establish a scenario of the future evolution of the current situation diagnosed and propose relevant corrective measures.
- CE7. Ability to prepare and present reports corresponding to the diagnosis made.
- CE8. Competence in the elaboration, management, monitoring, and control of environmental plans and projects in areas such as the exploitation of resources in the context of sustainable development, planning, and integrated land management, rural development plans, plans for the restoration and conservation of the natural environment, waste management, treatment of contaminated soils, environmental information systems.
- CE9. Mastery of criteria, regulations, procedures, and techniques of environmental and quality management systems. This includes the ability to identify and assess environmental costs; management of water supply and treatment systems; energy optimization with the use of clean and renewable technologies; air quality management and purification of atmospheric emissions; integrated management of health, hygiene, and occupational risk prevention.
- CE11. Ability to design and apply environmental indicators and sustainability strategies.

Generic competences:

- CG1. understanding and mastery of the fundamental knowledge of the area of study and the ability to apply that fundamental knowledge to the specific tasks of an environmental professional.
- CG2. Communication and argumentation, oral and written, of positions and conclusions, to specialized audiences or dissemination and information to non-specialized audiences.
- CG3. Ability to solve problems, generic or characteristic of the area through the interpretation and analysis of relevant data and evidence, the issuance of relevant evaluations, judgments, reflections, and diagnoses, with appropriate consideration of scientific, ethical, or social aspects.
- CG4. Capacity for consistent decision-making.
- GC5. Capacity for critical reasoning (analysis, synthesis, and evaluation).
- GC6. Ability to apply theoretical knowledge to the analysis of situations.
- GC7. Mastery of computer applications related to the field of study, as well as the use of the Internet as a means of communication and source of information.
- GC8. Capacity for autonomous organization and planning of work and information management.
- CG9. Ability to work in teams, particularly interdisciplinary and international teams characteristic of work in this field.

Basic competencies:

- CB1. That students have demonstrated to possess and understand knowledge in the area of environmental sciences that starts from the basis of general secondary education and is usually found at a level that, although

supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of their field of study.

- CB2. That students know how to apply their knowledge to their work or vocation in a professional manner and possess the competencies that are usually demonstrated through the development and defense of arguments and problem solving within their area of study.
- CB3. That students have the ability to gather and interpret relevant data (usually within the environmental sciences) to make judgments that include a reflection on relevant social, scientific, or ethical issues.
- CB4. That students can transmit information, ideas, problems, and solutions to both specialized and non-specialized audiences.
- CB5. That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

2.2. Learning goals

The student, to pass this course, must demonstrate the following results:

- Define and describe the concepts and terms specific to Environmental Impact Assessment.
- Develop the administrative procedure for Environmental Impact Assessment.
- Explain the structure of the inventory section of the natural and socio-economic environment, as well as the most important methodologies to develop them.
- Establish the vulnerability and response capacity of the main biomes to different disturbances or impacts.
- Use the different methodologies for the identification and valuation of impacts.
- Examine the basic criteria for the selection of alternatives.
- Identify the particularities of environmental impact assessment for the main types of socio-economic projects and activities in our environment, as well as propose the corresponding protective, corrective and compensatory measures.
- Be aware of the conflicts of interest associated with many EIA projects and know how to interact with the actors involved.

All these learning outcomes are aligned with the SDGs and the goals mentioned in the Objectives section of the subject.

2.3. Importance of learning goals

This subject is very relevant for the acquisition of the competence "Consulting and evaluation of environmental impact and natural risks", fundamental for the professional performance of graduates.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

The student must demonstrate that he/she has achieved the expected learning outcomes through the following evaluation activities.

The evaluation of this course will be carried out by means of a GLOBAL TEST.

The global test will be composed of the following activities:

Activity 1. Written theory exam

It will include questions of a theoretical-practical nature (short and developmental questions), representative of the global matter that has been dealt with in blocks I, II, and III of the theory program. It will be valued that the answers are expressed in a clear and simple way, the argumentation is correct, and the technical content is correct. The exam will represent 1/6 of the final grade. Concerning the SDGs, this evaluation activity is related to Target 4.7.

Activity 2. Practice written exam

The test consists of a written exam with 5 short questions on point 2 of the practice program and block IV of the theory program. It will represent 2.5/6 of the final grade.

Activity 3. Written exam on the environmental impact assessment of the main types of projects and activities (point 1 of the Internship Program).

Written test (1/6 of the final grade). Written exam with 5 questions of applied type. The minimum grade of each of these activities must be a 4 to make the average with the rest of the activities.

Activity 4. Collaborative Group Work

At the beginning of the semester, there will be a single work (Collaborative Group Work) to be done in groups of 3-4 people throughout the course. Exceptionally, in cases where it is not possible to carry out the group work, this work will be individual.

This work will be related to the development of an environmental impact study in industrial activity and leads to the achievement of a vision on the importance of designing industries to be sustainable, using resources more efficiently, and promoting the adoption of clean and environmentally sound technologies and industrial processes. About the SDGs, this

evaluation activity is related to Target 9.4.

It will be evaluated through the delivery of a written report and a public presentation of about 10-15 minutes and its subsequent defense. The degree of compliance with the proposed objectives, the procedure developed, the clarity of the presentation, and the mastery of the subject matter demonstrated during the defense will be evaluated.

This group work will be evaluated with a 1.5/6 of the final grade of the course, being necessary a minimum grade of 5 out of 10 to make the average with the rest of the activities.

There is the possibility of evaluating the Collaborative Group Work before the date of the global test of the evaluation. This option is recommended by the faculty of the course.

If activities 1 and/or 4 are approved in the first evaluation but the subject is failed, if the student wishes, the grades corresponding to these activities will be kept for the second evaluation of the same academic year.

Success rates in previous academic years

2018/2019	2019/2020	2020/2021
96.97%	93.75%	93.94%

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning process designed for this course is based on the following:

- Theoretical sessions, consisting of participative lectures. These may include the participation of external experts, as well as seminars conducted by students.
- The practical activities will consist, on the one hand, in field trips for the in situ analysis of EIA projects and, on the other hand, in the review of the reports and additional documentation of real projects processed in the competent administrations. There will also be seminars in which collaborative group work will be carried out under the supervision of the professor.

4.2. Learning tasks

The program offered to the student to help him/her achieve the expected results includes the following activities...

- Theory sessions. Face-to-face activity in which the contents of the proposed topics will be developed. The total duration of this activity throughout the course will be 10 hours.
- Seminars. Presential activity in which different examples of environmental impact evaluations will be studied; the cooperative work to be done will be defined and worked on, and their presentation will be carried out. It will be carried out in 20 sessions of 2 hours.
- Carrying out a collaborative group assignment. This non-face-to-face activity will focus on the realization of the work, which will be carried out in groups of three members.
- Field practices in which an Impact Assessment project will be analyzed in situ (10 hours).
- Office hours

4.3. Syllabus

This course will address the following topics:

Lectures

- **Topic 1:** Introduction to the concept of EIA
 - 1.1. Introduction to the concept of EIA
- **Topic 2:** Administrative methodology of EIA: The legal framework
 - 2.1. Legal precedents and specific regulations.
 - 2.2. EIA procedures according to state legislation.
 - 2.3. EIA legislation within the autonomous region of Aragon.
- **Topic 3:** Development of the environmental impact study. Methodologies.
 - 3.1. Environmental impact. Concepts and characteristics.
 - 3.2. Content of environmental impact studies.
 - 3.3. Description of the project and specific actions. Examination of alternatives.
 - 3.4. Environmental inventory.
 - 3.5. Evaluation of impact. Methodologies.
 - 3.6. Correction and control of impact.
- **Topic 4:** An evaluation of the environmental impact of key projects and activities.

- 4.1. Extractive activities
- 4.2. Lineal infrastructure
- 4.3. Wind farms
- 4.4. Dams
- 4.5. Irrigation projects

Practice sessions

- **Section 1.** Projects review (some of the next projects will be reviewed):
 - Quarry ?Los Quebraderos de La Serrana? EsIA.
 - Enlargement of the ?Yesa? dam EsIA.
 - Road to the ?Javalambre? ski station by the southern slope-side EsIA.
 - Electric line ?Mezquita de Jarque-Teruel? EsIA.
- **Section 2.** Analysis of the ?Biscarrués? dam EsIA
 - Land and water uses in the ?Gállego? catchment
 - Environmental and socio-economic traits of the potentially affected area
 - Geological and biological traits of the potentially affected area
 - EsIA?s official documents
 - Other documents

4.4. Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the Escuela Politécnica de Huesca website and Moodle.

Week	Theory sessions (h)	Practice sessions (h)	Autonomous work (h)	Total (h)
1	2	2	6	10
2	2	2	6	10
3	2	2	6	10
4	2	2	6	10
5	2	2	6	10
6	2	2	6	10
7	2	2	6	10
8	2	2	6	10
9	2	2	6	10
10	2	2	6	10
11	2	2	6	10
12	2	2	6	10
13	2	2	6	10
14	2	2	6	10
15	2	2	6	10
Total	30	30	90	150

4.5. Bibliography and recommended resources

- BB** Canter, Larry W.. Manual de evaluación de impacto ambiental : técnicas para la elaboración de estudios de impacto / Larry W. Canter ; traducción, Ignacio Español Echániz...[et al.] ; revisión técnica, José Vicente López Alvarez, José María Casillas Barral, Rosa María Gómez Alonso . Madrid [etc.] : McGraw-Hill, D.L. 2000
- BB** Conesa Fernández-Vítora, Vicente. Guía metodológica para la evaluación del impacto ambiental / Vicente Conesa Fdez-Vítora ; colaboradores, Vicente Conesa Ripoll [et al.] ; prólogo de María Teresa Estevan Bolea . 3ª ed. rev. y amp., reimpr. Madrid [etc.] : Mundi-Prensa, 1997 (reimpr. 2000)
- BB** Erias Rey, Antonio. Evaluación ambiental y desarrollo sostenible / Antonio Erias Rey, José Manuel Álvarez-Campana Gallo . Madrid : Pirámide, 2007

- BB** Español Echániz, I. (2016). Evaluación del impacto ambiental: fundamentos. Dextra Editorial.
- BB** Evaluación de impacto ambiental / Alfonso Garmendia Salvador ... [et al.] . reimp. Madrid : Pearson Educacion, 2005 (reimp. 2008)
- BB** Gómez Orea, Domingo. Evaluación de impacto ambiental : un instrumento preventivo para la gestión ambiental / Domingo Gómez Orea. 2ª ed. rev. y amp. Madrid [etc.] : Mundi-Prensa, 2003
- BB** Guía para la elaboración de estudios del medio físico / [autores Miguel Aguiló Alonso ... (et al.)] . 3ª ed. Madrid : Ministerio de Medio Ambiente, Centro de Publicaciones, 2006

The updated recommended bibliography can be consulted in:<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=25230>