

Unidade Curricular: Environmental Impacts and Sustainability

Área Científica: ENG

Duração: Semestral

Horas de trabalho: 121.5

Horas de contacto: 45

ECTS: 4.5

Docente Responsável: Ana Maria Barreiros

Outros Docentes: António Victor Carreira Oliveira

Learning outcomes of the curricular unit

- 1.To know the scope of the preparation of Environmental Impact Studies (EIS) as tools for sustainability in pursuing projects.
- 2.Understand the methodology of elaboration of EIS and analyze the descriptors of the environmental impacts addressed.
- 3.Interpret the phases of the Environmental Impact Assessment (EIA), its procedures and instruments in the Portuguese System.
- 4.To know the Strategic Environmental Assessment (SEA) methodologies and to assess the importance of its relationship with the EIA as a fundamental contribution to the Sustainable Development Goals (SDGs)
5. To know the 2030 Agenda and its 17 SDGs.
6. To know the challenges of the transition from the linear economy model to the circular economy model.
7. To know the tools of corporate sustainability and its relation to EIA.
8. Acquire skills in applying business sustainability tools while enhancing companies' competitive capacity including the adoption of ethical and socially responsible standards aligned with the SDGs.

Syllabus

- 1.Environmental Impact Studies (EIS). Basic concepts. Scope and legislative framework. Methodology for EIS elaboration.
- 2.Descriptors of environmental impacts characterization: water quality, air quality, noise, biological/ecological resources, landscape, natural and cultural heritage, socioeconomic. Methods of evaluation, prediction and mitigation. EIS Case Studies.
- 3.Environmental Impact Assessment (EIA). Basic concepts. EU Directives and Portuguese System. Stages/procedures of an EIA. Public and institutional consultation, decision making. EIA Case Studies.
- 4.Strategic Environmental Assessment (SEA). Basic concepts. Fundamental differences between SEA and EIA. European Directive and national legislation. Strategic basis model and methodology for SEA.
- 5.Sustainability. 2030 Agenda - Sustainable Development Goals (SDGs).
- 6.Circular and Sustainable Economy.
- 7.Business Sustainability - Concept and Tools.
- 8.Case Studies.
- 9.Ethics, Sustainability and Social Responsibility.

Demonstration of the syllabus coherence with the curricular unit's learning objectives.

In a first part, the UC covers a set of contents in the field of Environmental Impact Studies (EIS), providing competences to recognize the importance of their accomplishment for the development of different types of engineering projects, understand the methodology of its elaboration and evaluate the environmental descriptors to consider. In a second part, it covers contents related to Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA), which allow distinguishing the methodologies, procedures and instruments for each case and assessing the importance of their articulation. In the following third part, the UC covers contents concerning Sustainability, which make it possible to know the 2030 Agenda and its Sustainable Development Goals (SDGs), understand the challenges of the transition from the linear economy model to the circular one and acquire skills for the application of business sustainability tools as a reinforcement of competitive capacity.

Teaching methodologies (including evaluation)

Theoretical classes: oral exposition, supported by slide presentations. Theoretical-practical classes: case studies analysis, followed by a discussion of issues that allow students to explore and assimilate the subject matter; Study Visits. Continuous evaluation: 1. Realization of 2 group works, one under Environmental Impacts (TG1) and one under Sustainability (TG2). 2. Global written test at the end of the semester (Tg). The minimum required grade in each evaluation element is of 8 values.

Final mark (NF) = 0.3 TG1 + 0.3 TG2 + 0.4 Tg. Approval when $NF \geq 9.5$ values. Exam evaluation: 1. Realization of 2 group works, one under Environmental Impacts (TG1) and one under Sustainability (TG2). 2. Written Exam performed in one of the exam seasons (Ex). The minimum required grade in each evaluation element is of 8 values. Final mark (NF) = 0.3 TG1 + 0.3 TG2 + 0.4 Ex. Approval when $NF \geq 9.5$ values.

Demonstration of the coherence between the teaching methodologies and the learning outcomes

The learning objectives of the Curricular Unit are achieved through expository and active / participative teaching methodologies. The use of the expository method aims to introduce the concepts and the necessary tools so that the students acquire in a consistent and structured way the theoretical foundations. The use of active and participative methodologies adopts the format of conducting case studies under the two major areas of the UC, Environmental Impacts and Sustainability, individual and group, followed by discussion of issues that allow students to explore and assimilate the relevant content of the subject matter. Students are encouraged and supported in the search of information from relevant companies, project offices, public institutions and other considered good examples in order to enable them to consolidate the subject and the learning process. Outside the contact hours, and under tutorial guidance, the practical works in group to be carried out with a focus on the case studies addressed provide the full demonstration of the coherence of the contents taught with the learning objectives of the Curricular Unit, allowing the assessment of the acquired knowledge and promoting skills of autonomy and critical thinking.

Mandatory consultation/existence bibliography:

1. Glasson, J., Therivel, R., "Introduction to Environmental Impact Assessment", Routledge, 5th Edition, 2019.
2. Partidário, M.R., "Guia de melhores práticas para Avaliação Ambiental Estratégica", REN-APA, MAMAOT, 2012.

3. Morris, P., Therivel, R. (Eds), "Methods of Environmental Impact Assessment", Routledge, 3rd Edition, 2009.
4. Partidário, M.R., "Guia de boas práticas para Avaliação Ambiental Estratégica-orientações metodológicas", APA, MAOTDR, 2007.
5. APA, "Guias Metodológicos para a Elaboração de Estudos de Impacte Ambiental" (<https://apambiente.pt/>)
6. Ferrão, P.F., "Ecologia Industrial: Princípios e Ferramentas", IST Press, 2009.
7. Knowledge Alliance on Product-Service Development towards Circular Economy and Sustainability in Higher Education (www.katche.eu)
8. The Ellen MacArthur Foundation, "Towards the Circular Economy", Vol.1(2012), Vol.2(2013), Vol.3 (2014) (www.ellenmacarthurfoundation.org/publications)
9. Santos, S., "Introdução à Economia Verde", Plátano Editora, 2016. Marecos do Monte, H., Santos, M. T., Barreiros, A. B., Albuquerque, A., Tratamento de Águas Residuais - Operações e processos de tratamento físico e químico, Série CURSOS TÉCNICOS da ERSAR CT5, Livro, 2016.
4. Marecos do Monte, H., Santos, M. T., Barreiros, A. M., Tratamento de Águas Residuais – Processos de Tratamento Biológico, Série CURSOS TÉCNICOS CT6 da ERSAR, Livro, 2018.
5. Tchobanouglos, G., Burton, F. L., Stensel, H. D., Wastewater Engineering Treatment and Reuse. 5th Ed., METCAL&EDDY, McGraw Hill, 2013.
6. Droste, R. L., Gehr, R. L., Theory and Practice of Water and Wastewater Treatment, 2nd Edition, Wiley, 2018.