Course guide
480079 - 480079 - Decarbonisation and Climate Resilience Strategies

Last modified: 26/06/2024

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 717 - DEGD - Department of Engineering Graphics and Design.
748 - FIS - Department of Physics.

Degree: MASTER'S DEGREE IN SUSTAINABILITY SCIENCE AND TECHNOLOGY (Syllabus 2013). (Optional subject).

Academic year: 2024 **ECTS Credits:** 5.0 **Languages:** Spanish, English

LECTURER

Coordinating lecturer: BORIS LAZZARINI

Others: Manel Balfegó Brull

PRIOR SKILLS

No previous skills are required to take the course.

REQUIREMENTS

It is not mandatory, but it is recommended to have taken the course 'Climate Change Mitigation Policies'.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE08. The ability to coordinate, plan, develop and assess sustainable development programmes and sustainability strategies by identifying and fostering the capacities of participants, and considering the local, national, European and international organisations, strategies and policies involved.
CE07. The ability to design, develop and apply, in an integrated and coordinated manner, the theories and analytical techniques of the social, economic and Earth sciences, as well as management and research-action techniques and approaches based on sustainability science and technology in the fields of biodiversity and natural resources, the built environment and services, and production systems and information.

TEACHING METHODOLOGY

During the development of the subject, the following teaching methodologies will be used:

- Lecture (EXP): presentation of knowledge by the teaching staff through lectures.
- Practical Work (TP): resolution of practical exercises and case studies individually or in small groups.
- Assessment activities (AV).

During the development of the subject, the following training activities will be used:

- In-person
Theoretical classes (CTC): to know, understand and synthesize the knowledge presented by the teaching staff through master classes. Practical work classes (CTP): to participate in the resolution of exercises and different case studies. Debate of the conclusions with the teacher and other students in the classroom.

- Non-face-to-face
Autonomous study (EA): to study or expand the contents of the subject individually or in a group, understanding, assimilating, analysing and synthesizing knowledge.

LEARNING OBJECTIVES OF THE SUBJECT

In recent years, the European Union has introduced a set of political initiatives, through the well-known 'European Green Deal', with which it intends to set the path to follow towards a green transition, to achieve climate neutrality by 2050. Among these initiatives, a new regulatory framework stands out, which is based on the new European directive 'Corporate Sustainability Reporting Directive', which came into force in 2023 and replaces or complements the various frameworks on corporate sustainability, which were previously voluntary.

The new regulations, which currently require all large companies to publish detailed information on activities with an environmental and social impact, will affect a growing number of European organizations in the coming years. Also noteworthy is the growing interest of investors, consumers, policy makers and other social stakeholders in evaluating the non-strictly financial performance of organizations, in order to guide their investments towards businesses and initiatives that have a more sustainable and responsible approach. As a result, there is a growing interest in sustainability professionals who can lead decarbonisation processes and, in general, contribute to the creation of non-financial value in various types of organisations and companies.

Upon completion of the course, students know to:

- Correctly apply the phases of a decarbonisation strategy in an organisation, calculate the carbon footprint of a company or product using different methodologies, establish emission reduction objectives based on science and develop an action plan to achieve decarbonisation objectives and manage the risks and opportunities arising from climate change.

- Apply the main project management and business management techniques for the correct involvement of an organisation's stakeholders and for the correct implementation of the action plan.

- Critically analyse business decarbonisation strategies, carbon markets, greenwashing and their interaction with other environmental and social impacts.

STUDY LOAD

Type	Hours	Percentage
Hours small group	9,0	7.20
Self study	80,0	64.00
Hours medium group	12,0	9.60
Hours large group	24,0	19.20

Total learning time: 125 h

CONTENTS

1. Scientific, legal and business context of climate change mitigation

Description:
- Scientific aspects and current trends in climate change.
- Paris Agreement.
- Contribution of companies to global warming.
- Impact of the climate crisis on companies.
- Requirements of the new European CSRD (Corporate Sustainability Reporting Directive) legislation on climate change.
- Planning and management of the project.

Related activities:
- A.1: Discussion and selection of working groups.

Full-or-part-time: 6h
Theory classes: 6h

2. Carbon footprint measurement

Description:
- Methodologies for measuring the carbon footprint (GHG Protocol and ISO 14064).
- Difference between the carbon footprint of a product and an organization.
- Differentiation between direct emissions and those of the previous and subsequent phases of the value chain.
- Environmental and social issues related to these emissions and options to reduce them.

Related activities:
- A.2: Calculation of emissions from an activity considering scope 1, 2 and 3.
- A.3: Consultation of emissions factors in various public data sources (OCCC, DEFRA, etc.)

Full-or-part-time: 9h
Theory classes: 9h

3. Science-based emissions reduction targets

Description:
- Difference between bottom-up vs. top-down emissions reduction targets.
- SBTi (Science Based Targets Initiative) methodology.
- Establishment of targets for direct and indirect emissions of an entity/company (scope 1 and 2).
- Establishment of targets for indirect emissions (scope 3), and special sectors (FLAG, financial sector, steel, cement, etc.).

Related activities:
- A.4: Debate on non-science-based objectives, international equity, climate debt.
- A.5: Definition of reduction objectives for the projects chosen by each group.

Full-or-part-time: 6h
Theory classes: 6h

4. Establishment of action plans for the reduction of emissions

Description:
- Creation of emissions reduction scenarios.
- Analysis of 'business as usual' scenarios vs. decarbonisation scenarios.
- Analysis of emissions reduction measures in the direct/indirect operations of companies/entities and their value chain.
- Relationship of the company with the different interest groups (investors, suppliers, customers, workers, local communities, public entities, etc.)

Related activities:
A.6: Identification of direct and indirect emissions reduction measures (scope 1 and 2) according to the activity of the different case studies/companies.
A.7: Identification of indirect emissions reduction measures (scope 3) according to the activity of the different case studies.
A.8: Analysis of interest groups for a company/entity and creation of a plan for the involvement of key agents.

Full-or-part-time: 9h
Theory classes: 9h

5. Emissions compensation and neutralization

Description:
- Description of mandatory and voluntary emissions markets and their role in reducing emissions and capturing carbon.
- International financing of mitigation and adaptation to climate change.
- Problems and greenwashing.

Related activities:
- A.9: Calculation of the cost of offsetting and neutralizing, and calculation of the internal carbon price necessary to finance it.
- A.10: Creation of a communication and discussion strategy on the risks of greenwashing.

Full-or-part-time: 6h
Theory classes: 6h

6. Identification of risks, vulnerabilities and development of plans for climate resilience

Description:
- Identification and assessment of:
- Physical risks (acute and chronic).
- Transitional risks (legal, reputational, market and technological).
- Opportunities related to climate change.
Aspects of governance and resilience management.

Related activities:
- A.11: Definition of the main physical and transitional opportunities and risks and establishment of risk mitigation and opportunity maximization strategies.

Full-or-part-time: 6h
Theory classes: 6h

GRADING SYSTEM

The course has a practical orientation. The assessment will be based on the work and practical work carried out during the course (TR), which will be worth 50% of the final grade:

AV1 Continuous assessment (practical work/activities carried out during the course): 50%
AV2 Final presentation: 25% (10% final report; 15% presentation/defense)
AV3 Final exam: 25%

EXAMINATION RULES.

A final report of the group projects will be delivered on the ATENEA platform.
The project will be defended and discussed with all students.

RESOURCES

Other resources:
GHG Protocol:
https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf />
Scope 2:
https://ghgprotocol.org/sites/default/files/2023-03/Scope%202%20Guidance.pdf

Scope 3:
https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporing-Standard-EReader_041613_0.pdf

SBTi Getting Started:
https://sciencebasedtargets.org/resources/files/Getting-Started-Guide.pdf />
SBTi Criteria near-term:
https://sciencebasedtargets.org/resources/files/SBTi-criteria.pdf />
IFRS S2 Climate-related disclosures:
https://www.ifrs.org/content/dam/ifrs/publications/pdf-standards-issb/english/2023/issued/part-a/issb-2023-a-ifrs-s2-climate-related-disclosures.pdf?bypass=on />
Transition Plan Taskforce:
https://transitiontaskforce.net/wp-content/uploads/2023/10/TPT_Disclosure-framework-2023.pdf />
MITECO. Registro de Emisiones y Fuentes Contaminantes: PRTR
https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/sostenibilidad-industrial/registro-de-emisiones-y-fuentes-contaminantes-prtr.html />
European Industrial Emissions Portal:
https://industry.eea.europa.eu/ />