Universidad Zaragoza

Academic Year/course: 2021/22

69750 - Introduction to Circular Economy

Syllabus Information

Academic Year: 2021/22
Subject: 69750 - Introduction to Circular Economy
Faculty / School: 100 - Facultad de Ciencias
Degree: 627 -
ECTS: 6.0
Year: 01
Semester: First semester
Subject Type: Compulsory
Module:

1. General information

1.1. Aims of the course

The *Introduction to the Circular Economy* course offers a general overview on Circular Economy. In it, we introduce the fundamental concepts of the subject, which are developed in the remaining compulsory and optional courses. These approaches and aims are aligned with Sustainable Development Goal (SDG) No. 12 (Responsible Consumption and Production) of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/es/), in such a way that the acquisition of the learning results of the subject provides training and competence to contribute to a certain extent to its achievement.

1.2. Context and importance of this course in the degree

The *Introduction to Circular Economy* course is taught in the first semester to all students of the Master's Degree in Circular Economy. In this course, students learn to correctly use the essential vocabulary about Circular Economy and to relate the fundamental concepts of this subject. The course is taught from the University of Zaragoza.

1.3. Recommendations to take this course

Introduction to Circular Economy is taught after the training complements of the Master's Degree in Circular Economy in which the initial training of students is completed up to a homogeneous level of basic knowledge. In this way, once the learning complements have been completed, all students can adequately follow this subject. Regular use of the teaching platform and daily study of the concepts presented are recommended, with special emphasis on solving practical activities. Likewise, it is vital to consult the doubts and questions that pose difficulties in the teaching and learning process, for which personalised tutorials should be used.

2. Learning goals

2.1. Competences

BASIC COMPETENCES

CB6 - Have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with the first cycle, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context.

CB7 - Can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.

CB8 - Have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements.

CB9 - Can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and nonspecialist audiences clearly and unambiguously.

CB10 - Have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous.

GENERAL COMPETENCES

CG1 - Obtain information in Spanish and English using information technologies efficiently

CG2 - Manage, critically analyse and synthesise information

CG3 - Critically reflect in a systemic way and using causal relationships

CG4 - Formulate, analyse, evaluate and compare in a multidisciplinary way new or alternative solutions for different problems

CG5 - Work in interdisciplinary groups

CG6 - Transmit information efficiently through information and communication technologies

CG7 - Develop management skills (decision making, goal setting, problem definition, design, and evaluation)

CG8 - Properly manage available resources on time

SPECIFIC COMPETENCES

CE2 - Use the specific vocabulary and terminology of Circular Economy

CE6 - Apply the principles of Circular Economy management

2.2. Learning goals

The student, passing this course, achieves the following results:

1. Know the main characteristics of Circular Economy.
2. Be able to relate to each other the different aspects (scientific, technical, social, and economic) of Circular Economy.
3. Know tools for the implementation of the Circular Economy taking into account the legal and technical aspects.

2.3. Importance of learning goals

The knowledge acquired in the subject must provide the student a global overview of the importance of the Circular Economy.

3. Assessment (1st and 2nd call)

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

The course will be evaluated using two assessment methods (continuous and global), in such a way that the student will be assigned the grade that is most beneficial to him/her. For this, the grades obtained in the following tests will be used:

* Two reports (rated I1 and I2). Each report will consist of a memory on a topic related to the subject or the critical analysis of a research or popular article. The structure and format of the required reports will be communicated to students through moodle. The reports will be electronically sent to the lecturer.

* Final short, long and/or development answer test (scored as F). The test will be held simultaneously at each university under conditions that guarantee the proper identification of students and the impossibility of fraud.

The grades obtained by each student in the aforementioned evaluation activities will be weighted according to the following formulas:

Formula 1:

Final mark of the course: $0.15 \times I1 + 0.15 \times I2 + 0.7 \times F$

Formula 2:

Final grade for the course: F

It is not necessary to achieve minimum marks in the evaluation tests for the application of the above formulas. The final grade for the course will be the best grade obtained in each case after applying formula 1 and formula 2.

The number of official exam sessions to which enrollment entitles (2 per enrollment) as well as the consumption of these calls will be adjusted to the Rules of Permanence in Master's Studies and the Rules of Learning Assessment of the University of Zaragoza (https://ciencias.unizar.es/normativas-asuntos-academicos). To this last regulation, the general criteria for the design of the tests and the grading system will also be adjusted, and according to the same, the time, place and date on which the review will be held when publishing the qualifications will be made public.

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

Learning on this course is based on the combination of expository method and flipped classroom.

According to the expository method, the professor develops the presentation of the topics before the students present in the same classroom or other universities through videoconference. In addition, other teaching materials will be included in the Moodle platform that will allow dedicating some of the classes to interact with students, raising questions that allow relating concepts.

The workshop consists of a supervised session where students work individually or in groups and receive assistance and guidance when necessary from the teaching staff.

4.2. Learning tasks

Master class: 12 hours

Problem and case solving: 4 hours

Teaching work: 48 hours

Study: 84 hours

Assessment tests: 2 hours

4.3. Syllabus

1. Earth limits.

Depletion of natural resources. Pollution. Climate change. Biosphere integrity. Threat causes.

2. Notions of Circular Economy.

Linear economy. Circular flows. Circular Economy diagrams. Schools of thought.

3. Circular Economy tools.

Bioeconomy. Green Chemistry. Recycling technologies. Digital technologies. Design for Circular Economy.

4. Industrial ecology.

Biosphere metaphor. Industrial metabolism. Industrial symbiosis. Eco-industrial parks. Material flow analysis. Waste minimisation. Waste recycling. Waste treatment. Waste dumping. Structural waste.

5. Industrial logistics.

Supply chains. Acquisition. Freight transport. Storage. Reverse logistics. Open and closed loops.

6. Circular cities.

Circular urbanism. Sustainable construction. Collaborative housing. Urban mobility. Urban logistics. Urban metabolism. Sustainable urban drainage systems. Ecocities. Smart cities.

7. Law on Circular Economy.

European strategy. European Green Deal. Circular Economy Action Plan. 8th Environmental Action Program. European law. España Circular 2030. Law on Climate Change and Energy Transition. Regional and municipal law.

8. Circular Economy Policy.

Global scenario. Economic valuation of the Environment. Use value. Environmental externalities. Environmental risks. Vulnerability. Economy and company sustainability ratios. Sustainability indicators. Sustainable production and consumption.

9. Circular Economy and Society.

Indicator and impact methodology. Socio-economic indicators. Economic impact on companies. Impact on the territory. Sectoral and multisectoral models. Economic and environmental repercussions.

10. Circular Economy implementation.

Circular Economy Benefits. Boosters. Accelerators. Barriers. Technological change and circularity in economic models. Economy impact.

11. Circular Economy management.

Extended producer and consumer responsibility systems. Resilience in a context of global change.

4.4. Course planning and calendar

Information on schedules, calendar, and exams is published on the Master's page on the website of the Faculty of Sciences of the University of Zaragoza (https://ciencias.unizar.es/master-en-economia-circular). The presentation of reports will be carried out according to the calendar that will be announced in due course through the Moodle page of the course.

4.5. Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=69750&Identificador=C74175