



COURSE OUTLINE

1. COURSE INFORMATION

SCHOOL	Chemical and Environmental Engineering				
DEPARTMENT					
COURSE LEVEL	Master				
COURSE ID		SEMESTER Spring			
COURSE TITLE	Circular Eco	ular Economy			
COURSE MODULES					
in the case of credits being awarded in	in distinct parts of the course		INSTRUCTION		
. Lectures, Laboratory Exercises, etc. If credit units are awarded			HOURS PEF	2	CREDITS
uniformly for the whole course, indicate the weekly hours of			WEEK		
teaching and the total number of credits.					
		Lectures	3		
Laboratories		0			
Tutorial Exercises		0			
Total		39			
Add rows if needed. The teaching organization and teaching					
methods used are described in detail in (4).					
COURSE TYPE	Background and general knowledge, Development of new				
Background, General Knowledge,	skills, Management / Technology				
Scientific Area, Skills Development					
PREREQUISITES:	none				
INSTRUCTION/EXAM LANGUAGE:	English				
THE COURSE IS OFFERED TO	yes				
ERASMUS STUDENTS:					
COURSE URL:	EURECA-PRO LMS URL:				
	https://moodle.eurecapro.tuc.gr/course/view.php?id=77				

2. LEARNING OUTCOMES

Learning Outcomes

The learning outcomes of the course describe the specific knowledge, skills and competences of an appropriate level that students will acquire after successfully completing the course.

Refer to Appendix A.

- Description of the Level of Learning Outcomes for each course of study in line with the European Higher Education Area Qualifications Framework
- Descriptive Indicators of Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B
 Learning Outcomes Writing Guide

The course aims to present and analyze the basic principles and concept of Circular Economy. As a relatively new paradigm of economic development, Circular Economy is rapidly growing. The course will show how Circular Economy can be applied in practice, in which disciplines and areas, and the opportunities that provide for multi- and interdisciplinary collaboration. The course also aims at supporting the participant to carry out or reflect upon her/his research and study with a transdisciplinary approach. Emphasis is put on:

- The environmental problems and issues that led to the need for paradigm shift
- The relation and interconnection between sustainability and circularity
- The basic principles and approach of circular economy
- The adoption of circularity in the business sector and the industry
- The change in mindset and way of thinking

The benefits of circular economy for the users, the economy, the society and the businesses







General Competencies/Skills

Considering the general competencies that the graduate must have acquired (as listed in the Diploma Supplement and below), which one(s) the course enhances?

Search, analysis and synthesis of data and information, using the necessary technologies Adaptation to new situations Decision making Autonomous work Teamwork Working in an international environment Working in an interdisciplinary environment Production of new research ideas Project design and management Respect for diversity and multiculturalism Respect for the natural environment Demonstration of social, professional and moral responsibility and sensitivity to gender issues Exercise criticism and self-criticism Promoting free, creative and inductive thinking

Successfully evaluate issues and challenges related with:

- Understand the concept of circular economy and its differences and connection to sustainable development
- Adopt circular practices and changes across different sectors and fields

3. COURSE SYLLABUS

Week 1: Introduction to the Circular Economy – Class Overview

Week 2: Sustainable growth and Circular Economy

Week 3: Circular Economy Principles

Week 4: Waste and Systems-Level Thinking

Week 5: Enterprise Environmental Performance - Environmental Management Systems (Part I)

Week 6: Green Entrepreneurship & Financing

Week 7: Environmental Management & Policy

Week 8: Enterprise Environmental Performance - Environmental Management Systems (Part II)

Week 9: Enterprise Environmental Performance & Environmental Practices

Week 10: Material and Product Design

Week 11: Environmental Quality Assurance Techniques

Week 12: Circular Economy at the Urban and Regional Level - Case Studies

Week 13: Project presentations by students

4. TEACHING and LEARNING METHODS – ASSESSMENT

LECTURE METHOD Face to face, distance learning, etc.	Virtual	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY Use of ICT in Teaching, in Laboratory Exercises, in Communication with students	Powerpoint presentations, videos an	d e-class support
TEACHING ORGANISATION Describe in detail the way and methods of	ΑCTIVITY	Workload per semester (in Hours)
teaching. Lectures, Seminars, Laboratory Exercise, Field Exercise, Literature review & analysis, Tutoring, Practice (Placement), Clinical Exercise. Artistic	Lectures Tutorials	39
Lab, Interactive teaching, Educational visits, Project work, project, etc.	Projects Autonomous study	100 120
The student's study hours for each learning activity and the hours of non-guided study according to the ECTS principles are mentioned.	Course Total	
	(25 hours workload/ECTS credit)	259





ASSESSMENT METHODS	
Description of the evaluation process	Project (100%)
Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Public Presentation, Laboratory Assignment, Clinical Examination of Patients, Artistic Interpretation, Other	
Well defined student assessment criteria are	
mentioned. Mention whether and how the	
students can access them.	

DIGITIZATION (use of tools & software) 5.

RECOMMENDED INTERNATIONAL LITERATURE 6.

• Ellen MacArthur Foundation, "Towards the Circular Economy: Economic and Business Rationale for an Accelerated Transition," 2013. Executive Summary. • Stefanakis, A.I. and Nikolaou, I., 2021. Circular Economy and Sustainability - Management and Policy, Volumes I & II. Elsevier Publishing, Amsterdam, The Netherlands, September. • A. Wijkman and K. Skanberg, "The Circular Economy and Benefits for Society," Sections 2 and 4, 2015 • Ellen MacArthur Foundation, "Completing the picture – How the Circular Economy tackles climate change", September 2019. • Lieder, M., & Rashid, A. (2016). Towards circular economy implementation: a

comprehensive review in context of manufacturing industry. Journal of Cleaner Production, 115, 36-51. https://doi.org/10.1016/j.jclepro.2015.12.042

Acknowledgement: "Co-funded by the ERASMUS+ Programme of the European Union" (Contract number: 101004049 — EURECA-PRO — EAC-A02-2019 / EAC-A02-2019-1)



