

Circular Economy and Waste Management

30 Contact hours

AUEB/Online (Synchronous)

Course Overview:

The Circular Economy and Waste Management course provides a comprehensive understanding of the transition from linear economic models to sustainable, circular systems. It explores sustainable development principles, climate change effects, and policy frameworks for a circular economy. Students learn to analyze waste fluxes and develop sustainability strategies using tools like Circularity Compass, Circular Strategy Scanner, and Life Cycle Assessment. The course also covers waste management challenges like urban planning and stakeholder engagement. It also emphasizes corporate sustainability and circularity, focusing on ESG reporting, SDG integration, and circular business models. The course concludes with a final project presentation, equipping students with analytical, strategic, and communication skills for careers in corporate environmental responsibility and waste management.

Title	Circular Economy and Waste Management
EQF Level	6
Conduct mode	Synchronous Content: 30 Hours Assignment: Extra Lecturers: 6 Slides: approx. 50/course November – May: Implementation <ul style="list-style-type: none"> - Before the course: summary - Assignment
Aims of the Course	<ul style="list-style-type: none"> • To offer an interdisciplinary perspective on the challenges of climate change and sustainable development. • To provide students with an understanding of the circular economy principles and the policy frameworks that are propelling sustainability transitions. • To disseminate circular economy tools and refuse management strategies across various sectors. • In order to investigate corporate sustainability frameworks and stakeholder engagement strategies, which encompass the integration of ESG and SDGs. • To cultivate competencies in the measurement of circular economy success through the use of Life Cycle Assessment and other pivotal performance indicators.



	<ul style="list-style-type: none"> To facilitate the application of circular economy principles to real-world case studies and business models by students.
Learning Methods	<ul style="list-style-type: none"> Lectures (3 hours each) Case study analysis
Learning Outcomes	<p>By the conclusion of this course, pupils should be capable of:</p> <ul style="list-style-type: none"> Describe the fundamental principles of sustainable development and the effects of climate change. Analyse policy frameworks that promote circularity and contrast linear and circular economic models. Utilise circular economy instruments (e.g., Circularity Compass, Circular Strategy Scanner) to evaluate refuse flows. Assess waste management strategies, with a particular emphasis on urban infrastructure planning and e-waste. Develop strategies for engaging stakeholders that are effective in the transition to circularity. Examine the impact of SDG integration and ESG reporting on corporate sustainability. Perform a Life Cycle Assessment (LCA) of products and interpret circular economy key performance indicators (KPIs). Create circular business models that prioritise resource efficiency and sustainability. Develop a final project that integrates knowledge and suggests innovative refuse management solutions.
Skills (3-6)	<ul style="list-style-type: none"> Analytical Skills – Assessing circular economy principles, waste management strategies, and sustainability policies. Systems Thinking – Understanding the interconnection of waste flows, business models, and sustainability strategies. Stakeholder Engagement – Developing collaboration strategies to involve key actors in circular initiatives. Sustainability Reporting – Understanding ESG frameworks, SDG integration, and corporate sustainability reporting. Impact Assessment & Data Analysis – Applying KPIs and LCA tools to measure circular economy success. Business Model Development – Designing circular business strategies to drive sustainability transitions.
Requirements/Prerequisites	<ul style="list-style-type: none"> Bachelor's in Economics or Engineering studies; and At least 3 years experience in the construction or waste



	management sectors.
Course structure: outline of sessions	(see table below)
Learning Resources	<ul style="list-style-type: none"> • Presentations • Publications • Books • Websites with practical examples • Templates (e.g. Circular Business Model Canvas) • Online Material
Assessment methods	Written exam (70%) and Assignment (30%)
Language of delivery	English
Max number of students	30

Detailed Syllabus

Course Description

The Circular Economy and Waste Management course offers a thorough comprehension of the transition from linear economic models to sustainable, circular systems. The course delves into the principles of sustainable development, the effects of climate change, and the role of policy frameworks in facilitating the transition to a circular economy. In order to analyse waste fluxes and develop sustainability strategies, students will acquire practical knowledge of circular economy tools, including the Circularity Compass, Circular Strategy Scanner, and Life Cycle Assessment (LCA). The course explores specific waste management challenges, such as urban planning, stakeholder engagement, and e-waste, to provide participants with the necessary skills to address real-world sustainability issues.

Furthermore, the course prioritises corporate sustainability and circularity, addressing subjects such as ESG reporting, SDG integration, and circular business models. Participants will acquire the knowledge necessary to evaluate the success of the circular economy using impact assessment frameworks and to devise innovative circular business strategies. The course concludes with a final project presentation, during which students utilise their knowledge to suggest solutions for the implementation of the circular economy. Students will acquire analytical, strategic, and communication abilities through a combination of lectures, case study analyses, seminars, and presentations, which will equip them with the necessary skills to pursue careers in corporate environmental responsibility, sustainability, and waste management.



Learning Outcomes & Expectations

By the end of the course, students should be able to:

- Describe the fundamental principles of sustainable development and the effects of climate change.
- Analyse policy frameworks that promote circularity and contrast linear and circular economic models.
- Utilise circular economy instruments (e.g., Circularity Compass, Circular Strategy Scanner) to evaluate refuse flows.
- Assess waste management strategies, with a particular emphasis on urban infrastructure planning and e-waste.
- Develop strategies for engaging stakeholders that are effective in the transition to circularity.
- Examine the impact of SDG integration and ESG reporting on corporate sustainability.
- Perform a Life Cycle Assessment (LCA) of products and interpret circular economy key performance indicators (KPIs) at a basic level.
- Develop circular business models that prioritise resource efficiency and sustainability.
- Develop a final project that integrates knowledge and suggests innovative refuse management solutions.

Detailed Description of the Course Schedule:

Table 1 Course Schedule

Week & Topic	Description of session	Lecturer	Delivery method	Assignment/ Coursework	Assignment Deadline (Date/Time)
Introduction					
Week 1: Introduction to Sustainable Development and Climate Change	Presentation of Climate Change causes and impacts, as well as sustainable development principles	Prof. Phoebe Koundouri	Lecture	n/a	n/a
Week 2: Introduction to	Overview of linear vs. circular systems	Lydia Papadaki	Lecture	n/a	n/a



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Circular Economy and Policy Framework for Circular Economy	principles and examination of policies driving circular economy				
Circular Economy and Waste Flows					
Week 3: Circular Economy and Structural Waste	Presentation of Circular Economy tools, such as the Circularity Compass, Big Five Structural Wastes, Circular Strategy Scanner, Circularity Grid and Activity Cycle.	Lydia Papadaki	Lecture and Case Study Analysis	n/a	n/a
Week 4: E-Waste Management & Digital Circular Economy	Challenges and solutions in electronic waste	Dr. Kostas Dellis	Lecture	n/a	n/a
Week 5: Circular Economy in Urban Planning	Infrastructure and policy planning for circular cities	Dr. Kostas Dellis	Lecture	n/a	n/a
Week 6: Stakeholder Engagement practices	Introduction to stakeholder engagement approaches and techniques for circularity transition	Dr. Ebum Akinsete	Lecture and Case Study Analysis	n/a	n/a
Corporate Sustainability and Circulariy					
Week 7: SDGs and Business Integration and ESG Reporting and Corporate Sustainability	Strategies for integrating SDGs into business practices and understanding Environmental, Social, and Governance criteria in corporate reporting	Dr. Conrad Landis	Lecture	n/a	n/a



Week 8: Life Cycle Assessment Framework	Measurement of the Life Cycle of a product	Stathis Devves	and Case Study Analysis	n/a	n/a
Week 9: Measuring Circular Economy Success	KPIs and impact assessment frameworks	Dr. Conrad Landis	Lecture	n/a	n/a
Week 10: Circular Business Models	Development of Circular Economy Business Models	Lydia Papadaki	Lecture	n/a	n/a
Project Presentations					
Final Project Presentations	Student-led presentations on waste management solutions	Lydia Papadaki, Conrad Landis, Kostas Dellis	Presentations	n/a	n/a

Learning Resources:

- Presentations (e.g., slides)
- Publications (published papers available online to provide a more thorough understanding of the concepts introduced in the course)
- Books (books available online)
- Practical examples demonstrating the applicability of these concepts mainly from the construction waste management sector.
- Templates (e.g. Circular Business Model Canvas)

Assessment methods:

- Written case study development
- Oral presentation of the case study
- Final exam

Grading Rubric:



Criteria	Descriptors	Scores
Written case study development	A comprehensive written report that details the project’s findings, methodologies, and solutions. Critical evaluation of the proposed solutions using impact assessment tools and real-world data. Professional writing style and proper referencing of academic sources.	50%
Final Exam	The duration of the theory exam is 120-180 minutes. The practice exam consists of an individual or group assignment that will be implemented within the semester and will be of specific length.	50%

Instructors and Office Hours:

Primary Instructor:

Instructor’s name: Lydia Papadaki

Instructor’s email: lydia.papadaki@athenarc.gr

Office Hours: **Contact instructor to arrange appointment**

Short Bio: <https://ae4ria.org/members/lydia-papadaki/>

Secondary Instructors:

Instructor’s name: Phoebe Koundouri

Instructor’s email: pkoundouri@aueb.gr

Office Hours: **Contact instructor to arrange appointment**

Short Bio: <https://phoebekoundouri.org>

Instructor’s name: Dr. Ebum Akinsete

Instructor’s email: eakinsete@athenarc.gr

Office Hours: **Contact instructor to arrange appointment**

Short Bio: <https://ae4ria.org/members/akinsete-ebun/>

Instructor’s name: Dr. Conrad Landis

Instructor’s email: conrad@aueb.gr

Office Hours: **Contact instructor to arrange appointment**

Short Bio: <https://ae4ria.org/members/conrad-felix-michel-landis-2/>

Instructor’s name: Dr. Kostas Dellis

Instructor’s email: kdellis@aueb.gr

Office Hours: **Contact instructor to arrange appointment**

Short Bio: <https://ae4ria.org/members/dellis-konstantinos/>



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Instructor's name: Stathis Devves

Instructor's email: devves@aueb.gr

Office Hours: **Contact instructor to arrange appointment**

Short Bio: <https://ae4ria.org/members/stahis-devves/>



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