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Chapter 22. Circular Economy and Strategies of Sustainability

22.1. COURSE SUMMARY

Table 22–1

Audience and level of studies	Students (Bachelor)	
Group size	26–50	
Course duration	14 weeks	
Credits	6 ECTS	
Workload	Presence: 36h Self -study: 142h	Total: 178h
Contents/primary topics	• Circular economy • Corporate social responsibility • Sustainable innovation management	
Main course objectives	• Increased understanding based on the growing business sector of sustainable development, and managing, leading, and operating a sustainable business by incorporating circular economies into necessary strategies to stimulate growth	
Main teaching approaches	• Experiential learning • Collaborative learning • Inter-/transdisciplinary learning	
Main teaching methods	• Flipped classroom • Self-reflection tasks • Field trip	
Learning environment	Hybrid classroom (face-to-face and online learning)	
Link to Sustainable Development Goals (SDGs)	SDG 8 | Decent Work and Economic Growth | Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all SDG 9 | Industry, Innovation and Infrastructure | Build infrastructure, promote inclusive and sustainable industrialization and foster innovation	

Table 22–2

Impact assessment:	(None) Low/ Medium/ High	Explanation
1. Degree of student participation / activeness	High	Students make thoughtful contributions based on the lecture notes that advance the conversation and activities such as group discussions, brainstorming, active discussion with the expert, and gamification.
2. Degree of student collaboration / group work	High	Students come together in groups to discuss a topic, to see the opinions of others, and to work on a common task.
3. Degree of student emotional involvement	Medium	Students are expected to show enthusiasm for the topics discussed (obtained experiences from past years)
4. Degree of inter-/transdisciplinarity	High	Students coming from different disciplines are expected to share their knowledge and perspectives for the topic at the same time
5. Degree of student (self-) reflection	High	Students are expected to act on feedback given from their teachers and peers to improve their success
6. Degree of experience of real-life situations	Medium	Students are expected to be encouraged to be aware of the choices they can face in the market and how they fit into greater societal needs and supplies. In the course, students experience real-life situations with emotional short essay writing and field trips
7. Degree of nature-related experiences	Medium	Students learn how to discover principles, concepts, and facts for themselves and the topics with the help of intuitive thinking with in-class role play
8. Degree of stakeholder integration	Low	Students get practical experiences by working with people and using the resources in the market (in-class role-play with acting/drama coach and gamification to design waste and scarce sources in business processes)
9. Degree of integration between theory and practice	Low	Students make connections between fields, curricula, and the topics discussed in the class with take-home, case studies

22.2. COURSE INTRODUCTION

Teaching this course is important because the circular economy is a new production and consumption model that enables sustainable growth over time. The students will be able to understand how to drive the optimisation of resources, decrease the consumption of raw materials, and recover waste by recycling it or by creating a new product with the help of a circular economy. Economic sustainability, on the other hand, creates a stable economy. A stable economy is resilient to uncertainty, such as increasing costs in the energy sector and raw materials. Sustainability encourages the students to take responsibility for their actions and to contribute to a sustainable future.

In summary, it can be said that the goal of the course is to help students learn about the growing business sector for sustainable development and to learn how to handle, manage, and lead a sustainable business by incorporating circular economy principles into the required strategies for fostering sustainable growth. The content of the course focuses on business, administration, and law. The primary topics of the course include circular economy, corporate social responsibility, sustainable innovation management, values-based leadership, and business / corporate ethics.

The topics describe:

1. Sustainability and its relation with overproduction/overconsumption from business and economic points of view and multiple metrics for measuring sustainability.
2. The fundamentals of a circular economy and the characteristics of a circular business models.
3. The building of a sustainable culture in organisations.
4. Circularity enabling sustainability, the other enablers of sustainability, and the design of waste out of the business processes (Suárez-Eiroa et al., 2021).
5. Innovation led by sustainability and innovations that have improved the context of sustainability.
6. The characteristics of sustainable finance and the impact of investments.

22.3. LEARNING OBJECTIVES

Table 22–3

Learning objective dimension (UNESCO, 2017)	Operationalisation	Competency referred to (Rieckmann, 2018)
Cognitive	Gain an understanding of the function and implications of the Circular Economy and Sustainability Strategies	Strategic competency
	Recognize corporate social responsibility and sustainable innovation management	Systems thinking competency
Socio-emotional	Develop skills of self-questioning and problem-solving	Critical thinking competency
	Gain interpersonal communication and collaborative learning skills	Collaboration competency
	Practice the presentation skills	Collaboration competency
Behavioural	Gain self and peer-assessment skills with rubrics criteria	Anticipatory competency

22.4. COURSE OUTLINE

Table 22–4

Structure		Session focus	Course Sessions/Out of Class Activities (Self-Reflection Exercise, Homework, and Trips)
Week 1	Session 1 (1h)	Introduction to the course and self-reflection exercise. Introduction of the course on the Whiteboard platform. Short informative videos on the online collaboration platform.	Get acquainted with the course and methods used.
	Session 2 (2h)	Define sustainability from a business and economic perspective and its connection to excessive consumption and overproduction.	Reading article 1 (60 min.) Writing an emotional short essay in groups of five students on the topic of sustainability (1h, in-class activity). Students are expected to define sustainability in sectors that use resources efficiently to create long-term values through emotional essay writing. The emphasis should be on writing various case studies with various roles.
Week 2	Session 1 (1h)	Describe different metrics for measurement of sustainability.	Emotional short essay writing in groups of five students on the topic of measuring sustainability using various metrics (1h, in-class activity). Students are expected to define the measurement of sustainability with different metrics in sectors when writing emotional essays. The emphasis should be on writing various case studies with various roles.
	Session 2 (2h)	Peer Review of Sustainability	Article 1 Group Presentations (12 min each, in-class activity). Each group will send one representative to make the sustainability presentations (worked in groups in week 1, session 2).
Week 3	Session 1 (1h)	Define the basic principles of circular economy and the characteristics of circular business models	Reading article 2 (1h, in-class activity)
	Session 2 (1h)	Describe the benefits of business when transitioning to a circular business model	Writing an emotional short essay in groups of five students on the topic of a circular business model (1h, in-class activity). Students are expected to describe the benefits of business when transitioning to a circular business model in emotional essay writing. The emphasis should be on writing various case studies with various roles.
Week 4	Session 1 (2h)	Peer Review of week 3 session 1	Article 2 group presentations (12 min each, in-class activity). Each group will send one representative to make the sustainability presentations (worked in groups in week 3, session 1).

Structure		Session focus	Course Sessions/Out of Class Activities (Self-Reflection Exercise, Homework, and Trips)
	Session 2 (2h)	Peer review of week 3 session 2	Group Presentations (12 min each, in-class activity). One representative from each group to make the presentations about the benefits of business when transitioning to a circular business model (worked in groups in week 3, session 2).
Week 5	Session 1 (1h)	Understand how to build a sustainable culture in the organization, including how to incorporate other business strategies into the process	In groups of five students, have a group discussion (in-class activity). Each group has one representative who discusses business strategies for organizational sustainability culture.
	Session 2 (2h)[26]	Introduction to Experiential Learning	Playing a role (4 min each, in-class activity). Each student is expected to play a role in a real-world scenario and to apply the actual skills required to deal with the situation.
Week 6	Session 1 (1h)	Identify and develop a plan to avoid potential pitfalls when changing organizational culture	Students individually list keywords of potential pitfalls and make a plan for organizational culture change (in-class activity).
	Session 2 (2h)[27]	Field Trip	Each student will receive two papers for brainstorming purposes: i. Explaining the significance of field trips; and ii. describing the company's structure (one week before the field trip) Brainstorming (while on a field trip) focuses on the field trip's objectives: i. To provide first-hand knowledge, ii. To pique people's interest and motivation in science, iii. To make learning and interrelationships more relevant, iv. To improve observation and perception abilities, and v. To encourage personal (social) development (Michie, 1998)
Week 7	2h[28]	Mid-Term Exam	
Week 8	Session1(1h)	Analyse how the cycle achieves sustainability and describe various other drivers of sustainability	Group Discussion (in-class activity).
	Session 2 (2h)[29]	Invitation of a business expert	Active discussion (in-class activity).

26 Acting/drama coach works with students for 40 hours out of class.

27 Self-study for the trip is 2 hours.

28 Self-study for the mid-term exam is 20 hours.

29 Self-study for preparation of the questions for the business expert is 6 hours.

Structure		Session focus	Course Sessions/Out of Class Activities (Self-Reflection Exercise, Homework, and Trips)
Week 9	Session 1 (1h)[30]	Learn how to design waste in business processes	Gamification: LEGO Game (in-class activity) based on prior game self-study (out-of-class activity).
	Session 2 (2h)	Peer Review	Individual presentations on the topic of waste design in business processes (3 minutes each, in-class activity).
Week 10	Session 1 (1h)	Understand how sustainability drives innovation and describe innovations that improve sustainability	Gamification (in-class activity). Use illustrations to demonstrate the concepts.
	Session 2 (2h)	Peer Review	Individual presentations (3 min each, in-class activity) on the topic of innovations that improve sustainability.
Week 11	Session 1 (1h)[31]	Use the ReSOLVE framework as a springboard to create sustainable innovation	Case Study. McKinsey & Company's ReSOLVE framework applies the core principles of circularity to six actions: regeneration, sharing, optimization, recycling, virtualization, and exchange. Form groups of five students and brainstorm an idea (1h, max 500 words, out-of-class activity).
	Session 2 (2h)	Peer Review	Group presentations on the topic of sustainable innovation (12 minutes each, in-class activity).
Week 12	Session 1 (1h)	Describe the characteristics of sustainable finance	Individual comment writing (in-class activity).
	Session 2 (2h)[32]	Visit a Bank	Brainstorming (out-of-class activity). The first discussion paper about the structure and function of the bank will be distributed to each student one week before the visit to assist the students in asking questions of the managers.
Week 13	Session 1 (1h)	Learn how to measure the impact of investments	Individual comment writing (in-class activity).
	Session 2 (2h)[33]	Visit a Bank	Brainstorming (out-of-class activity) The second discussion paper about the structure and function of the bank will be distributed to each student one week before the visit to help the students to ask questions to the managers (out-of-class activity).
Week 14	2h[34]	Final Exam	

30 Self-study for the LEGO design is 20 hours.
31 Self-study for Take-home is 10 hours.
32 Self -study for the first discussion paper is 2 hours.
33 Self-study for the second discussion paper is 2 hours.
34 Self-study for the final exam is 40 hours.

22.5. TEACHING APPROACHES AND METHODS

Experiential learning, collaborative learning, and inter-/transdisciplinary learning are the main teaching approaches used in this course. Experiential learning focuses on student-appropriate materials and skills. Experiential learning fosters real-world relevance, allows for creativity and reflection, teaches the value of mistakes, directs students toward the future, and prepares them for future life (Clancy et al., 2021). Collaborative learning allows students to work together and learn and grow from one another. Its advantages include the ability to develop higher-level thinking, communication, self-management, and leadership skills. It also boosts student retention, self-esteem, and accountability (Marjan and Seyed, 2012). Gamification in this course assists students in the assimilation of new information, group work, and the use of scarce resources such as elements of the game. It also assists students in developing their creativity and innovative abilities. With critical reflection, inter-/ transdisciplinary learning allows for a different understanding of subjects. This method of instruction allows students to develop concepts and skills in a variety of subject areas (Taylor et al, 2021).

Flipped classrooms, self-reflection tasks, and field trips are among the teaching methods used. Students have more collaboration time to cover subject activities, discussions, and peer-reviewing when using the flipped classroom method (Fuchs, 2021). Students evaluate their work using criteria, track their learning progress, identify their knowledge and skill strengths and weaknesses, set realistic learning goals, and reflect on their learning processes during the self-reflection task. Students benefit from real-world learning, have access to tools and environments not available at school, and develop socio-emotional growth during the field trip. Field trips supplement the curriculum, improve students' observation skills, and broaden their awareness (Nils and Budke, 2021).

Students will have a fundamental understanding of the topics as well as deep learning as a result of the teaching methods. Students must also communicate and collaborate in groups with diverse actions and motivations. They will gain the necessary experience and knowledge to achieve the desired learning outcomes. The lesson plan, on the other hand, includes activities that are designed to foster respect and provide a safe environment in which to discuss sensitive topics. The plan includes activities that will aid in the understanding of key terminology, allow for the exchange of ideas, and highlight the complexities of terminology. The lesson plan includes one or more visible thinking routines, with a focus on how students benefit from the lesson objectives. These activities include incorporating peer education elements throughout the curriculum and emphasizing the empowering aspects of learning from peers.

The motivations for these activities are not always clearly articulated. There is a clear indication that the role of emotion has been addressed, and the curriculum elements will effectively help build empathy. The lesson plan follows through on all of its learning objectives. The course plan includes a variety of activity types as well as a large number of ideas or elements. The course's design encourages the use of adaptive learning. It is well known that in traditional learning, education is not based on individual needs, capacity, or understanding of the topic (Dewey, 1938). Students in adaptive learning, on the other hand, receive a personalized learning plan and the opportunity to learn the concepts (Feldstein & Hill, 2016).

As the world's education demand grows, the use of intelligent educational tools such as LEGO games, as well as efficient and effective learning management systems (MOODLE and Whiteboard), becomes increasingly important. The learning platform integrates technology and communication tools to activate the learning process while focusing on the needs of various students. A learning platform, for example, can aid in the development of students' skills in an active learning environment. Furthermore, regular monitoring and analysis of student performance via the information processing platform can improve learning efficiency and quality.

22.6. EXERCISES

The following topics are commonly used for collaborative work: sustainability (a holistic approach that focuses on ecological, social, and economic dimensions), planned obsolescence model, and impact investment. Planned obsolescence refers to a strategy that intentionally ensures that the current version of a given product is out of date or useless within a specified time frame (Bulow, 1986). Obsolescence can be achieved by introducing better alternative models or by purposefully designing products to disable normal functions within a specific time frame (Orbach, 2004). In either case, consumers will theoretically prefer newer products over older ones. Sustainable, responsible, and impact investing is an investment strategy that takes into account environmental, social, and corporate governance standards to generate long-term competitive financial returns and positive social impacts (Hirst, 2016). It is applicable to all asset classes, such as stocks, bonds, and cash.

Emotional Short Study Writing on Sustainability

In groups of five students, the students are expected to discuss Article 1 for defining sustainability from a business and economic standpoint, as well as its connection to excessive consumption and overproduction.

Then, they describe various metrics for measuring sustainability and work together to write a case study (a detailed study of sustainability in a sector) of at least 300 words, assigning responsibility for the required sections. It represents a short, emotional essay. Students create PowerPoint slides for the case studies and select a group leader to lead the presentations.

They deliver speeches (at most 10 min., each). Peers can ask questions and grade the presentations using Rubrics Criteria after the presentations. The total grade will be the sum of the student and teacher grades.

Emotional Short Study Writing on Circular Economy and Circular Business Models

In groups of five persons, the students discuss article two for defining the basic principles of circular economy and the characteristics of circular business models.

They work together to write a case study (detailed study of circular economy and circular business models in a sector) of at least 300 words and are assigned responsibilities for the necessary sections (emotional short essay writing).

Students create PowerPoint slides for the case studies and select a group leader to lead the presentations. They make the presentations (at most 10 min. each). Peers can ask questions and grade the presentations using Rubrics Criteria after the presentations. The total grade will be the sum of the student and teacher grades.

Potential Business Change Pitfalls and Steps to Change the Company Culture

In one hour, students must list the keywords for potential business change pitfalls and create a plan for the steps to change the company culture. When changing organizational culture by Rubrics Criteria, it is critical to identify and develop a plan to avoid potential pitfalls. The plan should not exceed 200 words. The teacher will be in charge of grading.

Gamification

In this session, students will participate in a LEGO® game where students will play the role of a manufacturer who needs to decide the planning of materials to maximise their profit and design waste out of the business processes. Following the game, students will be required to give individual presentations. The total grade will be the sum of the student and teacher grades.

Illustrating Concepts

Discover how sustainability can be used to drive innovation and describe innovations that have improved sustainability. Use illustrations to demonstrate the concepts. Big fish, for example, eat small fish. Innovative drawing should also be used to explain the expression. In economics, the phrase "big fish eats small fish" refers to how small organizations are often swallowed up or destroyed by those with more market power, such as monopolies. Students will be expected to give individual presentations at the end of the process. The total grade will be the sum of the student and teacher grades.

Individual Comment Writing

Students should read selected chapters of the book by Stefanakis & Nikolaou (2021) to learn about sustainable finance, investment, and methods for measuring the impact of investments. As a class activity, students will write their thoughts on the aforementioned concepts. The essay should not be longer than 400 words. The comment writing time is 40 minutes. Each student is given an essay written by another student and has 20 minutes to grade it. The teacher will be in charge of delivering the papers. The total grade will be the sum of the student and teacher grades.

22.7. ASSESSMENT

The deliverables in this course are presentations and short essays throughout the course (weeks 2–11), a case study (week 11) and two exams (week 7, week 14). The following rubics will be used to assess students continuous performance on presentations and essays.

Table 22–5

Scoring Rubric for Oral Presentations	**Scoring Rubic for Short Essays**
Content and Scientific Merit (60 points): • Introduction: Defines background and importance of research States objective, and can identify relevant topics • Body: The presenter has a scientifically valid argument Addresses audience at an appropriate level Offers evidence of proof Describes methodology The talk is logical • Conclusion: Summarizes major points of the talk. Summarizes potential weaknesses Provides students with a "take-home" message	Content: • Citations provided (20 points)
Delivery of speech (20 points): • Speaks clearly and at an understandable pace. • Maintains eye contact with the audience. • Well-rehearsed • Limited use of filler words ("um," "like," etc.). • Speaker uses body language appropriately • Speaker is within time limits	Delivery: • Posts on time (20 points) • 500 word length requirements met (20 points)
Audio/Visual (20 points): • Graphs/figures are clear and understandable • The text is readable and clear • Audio/Visual components support the main points of the talk • Appropriate referencing of data	Style: • Language is grammatically correct and professional (20 points)

22.8. PREREQUISITES

Required prior knowledge from students:

- Basics of Microeconomics and Macroeconomics
- Basics of innovation management
- Basics of sustainable growth

Required instructors and their core competencies:

- Lecturer (competences: economics, technology, management, innovation, corporate responsibility, growth)

- Acting/drama coach (competences: theatre-based teaching)
- Business expert (competencies: real-life business sector expertise)

Required tools:

- Online communication platform (e.g., Zoom)
- Online learning platform (e.g., Moodle)
- Online collaboration platform (e.g.,Whiteboard)
- Gamification (e.g.,Leaderboard)

22.9. RECOMMENDED RESOURCES

Topic 1–2 Sustainability:

- Balcioglu H. (2020). The Economics of Space. *International Journal of Innovative Science and Research Technology*, 5(9), 1242–1243.

Topic 3–4 Circular Economy & Circular Business Model:

- Balcıoğlu H. B. and Kıvanç V. (2009). Comparison of Macroeconomic Performance of Selected Asian Countries. An Econometric Analysis of China Economic Growth and Policy Implications. *Theoretical and Applied Economics*, 9(538), 9–16.

Topic 5–12 Organizational Culture, Business Strategies, Business Process, Sustainable Innovation, Sustainable Finance & Impact of Investments:

- Stefanakis, A., & Nikolaou, I. (Eds.). (2021). *Circular Economy and Sustainability: Volume 2: Environmental Engineering*. Elsevier.

22.10. GENERAL TIPS FOR TEACHERS

Circular economy is an integrated and innovative management approach in which, in addition to regular entrepreneurial competencies, systems thinking and inclusivity are important. A society that represents a circular economy necessitates different knowledge, skills, and attitudes. The teaching approaches and methods implemented in this course have been chosen to aid educators in developing such versatile competencies compatible with circular economy. To implement this course effectively, it is critical to maintain open lines of communication between students and educators, as well as among students, taking into consideration the cultural and language differences between participants and thus ensuring inclusivity.

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