

Circular Economy: An interdisciplinary Approach

Course Syllabus

<https://courses.edx.org/courses/course-v1:WageningenX+CE01x+3T2019/>

Topic

The transition towards a circular economy is one of the biggest challenges in order to create a more sustainable society. This transition requires an interdisciplinary approach, combining socio-technical, managerial, and environmental considerations. In this course you will analyse what it takes to create a circular economy including sustainable supply chains. We will take a systems approach to the circular economy, considering different stakeholder perspectives, their incentive structures, and their impacts on circular alternatives.

Learning Outcomes

After successful completion of this course, you will be able to:

- understand the concept of a circular economy, based on its socio-technical, managerial and environmental characteristics;
- understand how a circular economy deviates from the current, mostly linear, system;
- apply circular systems engineering to analyse complex circular systems;
- assess the use of Life Cycle Analysis (LCA) and Agent Based Modelling (ABM) in the context of the circular economy, and apply these tools in a case study;
- integrate the results of a case study taking into account socio-technical, managerial and environmental aspects and formulate improvements for a transition towards a circular design.

Level & Prerequisites

The level of the course is advanced. To optimally learn in and complete the MicroMasters Program we expect you to have a bachelor degree in social sciences (preferably business or economics).

Time Commitment

The total effort for this course is estimated at 150 hours for an average learner. So, if you have 15 hours per week to spend, it will take you about 10 weeks. However, since the course is run in a self-paced mode, you can progress through the modules at your own speed.

MicroMasters Credential

Circular Economy: An Interdisciplinary Approach is the first course of our MicroMasters programme Business and Economics for a Circular Economy, or for our MicroMasters programme Business and Operations for a Circular Bio-Economy. Both programmes consists of three courses and a capstone. If you successfully complete all of these with a Verified Certificate, you earn the MicroMasters Credential. With this credential you may apply to the Master of Science programme Biobased Sciences at Wageningen University & Research (120 ECTS, 2 year full time on campus programme). If you are admitted and would like to be exempted from courses in the MSc programme, you can send a waiver request for equivalent campus courses (up to 18 credits). Details about the admission requirements of the on-campus master: www.wur.eu/mbs.

Course Structure

Module 1: Introduction to the Circular Economy

In this module, we will investigate how the circular economy is defined, how it deviates from the current so-called "linear" system and how it relates to other sustainable schools of thought. At the end of this module, we hope you will have learned the main principles of the circular economy and the reasons to invest in a transition towards a circular economy.

Module 2: Circular Systems Engineering

In this module, we will introduce you to the concept of systems thinking. A systematic approach to problems and situations is necessary when dealing with complex systems. In addition to implementing this way of thinking, engineering solutions are also needed when closing cycles. At the end of this module, you will know how to apply systems thinking when analysing and transitioning to circularity, and have learned some interesting examples of engineering solutions.

Module 3: Transition Management

In this module, we will discuss how circular changes come about within companies and society. What is needed for businesses to successfully transition towards circularity? What are some useful skills you can develop yourself to help transform industries and your own environment?

Module 4: Life Cycle Assessment (LCA)

In this module, you will learn about the strengths and weaknesses of LCA, and how it can be used to quantify the environmental impact of circular products. After completion of this module, you'll understand the principles of LCA and know what questions LCA can answer.

Module 5: Agent Based Modelling (ABM)

Agent Based Modelling is a tool that can be very useful when researching circular economy situations. In this module, you will learn what ABM is, how it works and when it can be applied. You don't have to learn how to program code yourself – but if you want to, you can.

Module 6: Case

The last module contains a case study, in which you will apply everything you have learnt so far.

Course Calendar

EVENT	DATE	TIME*
Opening course (all modules)	3 December 2019	0:00 UTC
Due date submitting written advice (Module 6)	19 March 2020	23:00 UTC
Due date peer-reviewing written advice (Module 6)	2 April 2020	23:00 UTC
Due date module exams and graded questions (Module 6)		
Closing course		

* Please be aware that these are UTC times; check what time this is for your time zone.

The course is run in a self-paced mode, allowing learners to progress through the modules at their own speed. The course remains open for 17 weeks, giving all learners enough time to complete it.

Grading Policy

For those of you who are taking the course to obtain a Verified Certificate, a minimum grade of 60% is required. The module exams and graded parts in Module 6 do not contribute the same to your overall grade:

MODULE	EXAMINATION TYPE	WEIGHT EXAMINATION
Module 1	Module Exam	10%
Module 2	Module Exam	10%
Module 3	Module Exam	10%
Module 4	Module Exam	10%
Module 5	Module Exam	10%
Module 6	Graded Questions	20%
Module 6	Written Advice	30%

Academic Policy

We expect each student to complete the graded assignments and the final exam on their own, not in collaboration with other students.

Discussion Forum Participation

As a learner of this course you are part of a diverse learning community that is at the heart of a meaningful learning experience. The discussion forum is an essential part of this online course. In many assignments you are asked to discuss your findings on the forum with other learners. Moderators and/or instructors are participating in the forum to help facilitate an effective dialogue and support the discussion forum guidelines. If you are new to our online courses, please take a moment to read the [Discussion Guidelines](#).

What's the difference between audit and verified track?

The course offers two possibilities: an audit track and a verified learner track. The audit track comprises most of the course but also lacks important information, particular on the assignments where you handle the life cycle assessment results and the written advice to the municipality and receiving staff feedback instead of peer feedback on your assignments. All graded assignments are only available to learners in the verified track. The verified track provides the complete course and the full experience.

Topic / activity	Module	Available in audit track (free)	Available in verified track (paid)
Introduction to the Circular Economy	1	✓	✓
Circular Systems Engineering	2	✓	✓
Transition Management	3	✓	✓
Life Cycle Assessment (LCA)	4	✓	✓
Agent Based Modelling (ABM)	5	✓	✓
Case	6	✓	✓
Intermezzo	1 to 5	✗	✓
Module Exams (graded)	1 to 5	✗	✓

Graded Questions (graded)	6	✘	✔
Written Advice (graded)	6	✘	✔
Certificate (if you receive a passing grade)	N/A	✘	✔

If you are looking for some basics about circular economy, we welcome you in the audit track. However we encourage everyone who want to use this course for a career enhancement and who's looking for more in-depth knowledge about circular economy from an interdisciplinary perspective, to upgrade to the verified track to get access to all course materials.