CIRCULAR ECONONY AMDCO-DESIGN

CIRCULAR ECONOMY

Welcome to the Summer School - Circular Economy and Co-design! Our main focus here is to help you 'learn how can circular economy and co-design come together to promote real positive change!'. This is a unique chance to learn and develop your ideas in an international, multidisciplinary context and experience hands-on work in high-quality workshops of Aalto University.

The Summer School will help you construct a systemic understanding of the change needed for transforming the current linear economy towards circular economy. Circular economy is a powerful way to address climate change, resource scarcity and biodiversity loss while also meeting critical social aspects of sustainable development. The focus of these learning activities will be on how to prevent waste and pollution, how to keep products and materials in use longer and how to regenerate the whole system towards a better balance.





The content of the summer school courses was created in collaboration with academics from this year's partner universities: Singapore University of Technology and Design, Tecnológico de Monterrey, Parsons School of Design (the New School), The Oslo School of Architecture and Design, Politecnico di Milano and Delft University of Technology.

The initiative's aim is to invite international students to the Aalto University in order to build capacity for collaboratively solving the big challenges of our time. Teaching will be implemented through co-teaching both on-site at the Otaniemi campus and online.

The content of the course was designed around three core themes: the **MATERIALS AND PRODUCTS** in circular economy, the **SYSTEM UNDERSTANDINGS** of the circular economy and the role of future **SCENARIOS**. The Summer School aims to increase students' understanding of the importance of the transition to a circular economy, and of the crucial role of design, designers and consumers in this change.

LEARNING ACTIVITIES

Credits: 6 ECTS = 162 study hours

The Pre-learning task

The summer school was kicked off with a pre-learning task. Your statement posters will be exhibited at the Väre lobby.

Face-to-face teaching sessions

The mornings will be dedicated to lectures, workshops and seminars led by academics from the world's leading design and technology universities.

Individual studies

Individual studies are composed of course material such as video lectures, reading packages and offline activities to be carried out at your own speed and time.

X Group task: the Circular Economy project

The main assignment of this course is a group project work on circular economy. Most afternoons are dedicated to group work, production work at the ARTS workshops, tutoring and feedback sessions, which will finally lead to an exhibition at the Väre building lobby on the last day of the summer school.

There is one Zoom link for all activities: https://aalto.zoom.us/j/65270409557

Course material will be shared through mycourses.aalto.fi. Also, you are expected to complete course tasks on myCourses.

AALTO Summer school team









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Summer school teaching team



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Maggie Pee

SUTD



Apple Koh

SUTD

TIMETABLE of the Summer School



	Monday 1 CAug	Tuesday 2 Aug	Wednesday 3 Aug	Thursday 4 CAug	Friday 5 CAug		
ng Sessions	 9.00 Design in Circular Economy (Kirsi Niinimäki) 10.30 Complexity Science and speculative 	 9.00 Sustainable Cities and Urban Metabolism (Peter Ortner & Lynette Cheah) 10.00 Circular City 	 8.45 Introduction to Product Life Cycle Thinking (Mei Xuan Tan) 10.00 Product Disassembly of Coffee Machine Workshop (Wei Lek Kwan, Mei Xuan) 	9.00 Biomimicry: Patterns, cycles, systems and functions (David Sánchez Ruano)	9.00 From DIY materials to industrial symbiosis (Luca Alessandrini)	Saturday 6 Aug	
orniı	Design Practices (Jeongki Lim)	Scenarios (Peter Ortner)	Tan, Maggie Pee, Apple Koh)		Room: M202	Trip to Nuuksio	
Š	Room: F102	Room: F102	via Zoom	Room: M202		(more information	
	Lunch Break (12.00-13.00)						
	Individual studies >>> on myCourses	Design for Regenerative Cultures (Carlos Cobreros Rodríguez)	Scenarios for system changing (Idil Gaziulusoy)	Design Justice I (Caroline Dionne)	Co-design (Sampsa Hyysalo)		
Afternoon Sessions	13.00 Workshop orientation (3D printing, Waterjet, PrintLab, Laser cutting, Wood, Metal, Multimaterial + Sculpture, TAKEOUT, Biofilia)	12.45 Meet with Ena and Matti at Väre lobby	13.00 Checking group formation	13.00 Group work: Circular Economy Project	13.00 Group work: Circular Economy Project – planning workshop work for week 2		
	14.00 Poster presentations 16.00 Speed dating led by	15.00 Recycling Centre visit	13.30 Group work: Conceptualising the Circular Economy Project	+Tutoring (mandatory)	+Tutoring (optional) Room: F101 & 102		
	ARTS tutors Place: Väre Lobby		16.00 Short presentations of initial ideas + tutoring		15.00 Panel Discussion: Geographical Wisdom		
	17.15 Meeting at the lobby (with Venla, Ena and Matti to load extension tickets for the Nuuksio trip)		Room: F101 & 102	Room: F101 & 102	Place: Aalto Design Factory		
		Groups formedProject concept & description ready!Group forum post:Workshop bo+ 1st forum post+ 2nd forum postDaily insightsfollowing w					
	Milestones for group work >>>			()	X	X >	



Social Program: Weekend trip to Nuuksio Natural Park

6 August - Saturday

About Nuuksio:

https://www.visitespoo.fi/en/best-in-espoo/nuuksio-national-park/ https://haltia.com/en/

11.10 Meet Ena & Matti at Töölö Towers

13.20 Arrive at Nuuksio

14.00 Nuuksio activities start

Return on Sunday independently

Nuuksio return info

- Walk to bus stop: Haltila
- Take bus 245A towards Espoo keskus
- Get off at Espoon Asema
- Take E train towards Helsinki
- Get off at Main Railway Station
- Walk to Töölö Towers

(Details of specific times/other routes can be found on HSL App)

Contact Venla if there are any problems!

Monday 8 CAug	Tuesday 9 Aug	Wednesday 10 Aug	Thursday 11 Aug	Friday 12 Aug
9.00 Tools and strategies for designing sustainable products, spaces and processes (Erminia D'Itria & Pedro Damián Pacheco Vásquez)	 9.00 Participatory Design Practices 10.30 Design Justice II (Cynthia Lawson Jamarillo & Jeongki Lim) 	9.00 Whole System Mapping & Product Service Systems (Jeremy Faludi)	9.00 Group work: Circular Economy Project+production in workshops+Tutoring (optional)	9.00 Final touches for the exhibition
Room: M202, via Zoom	Room: M202	Room: M202	Room: F101 & 102	
	Lur	nch Break (12.00-13	3.00)	
Sharing, rhythms and practices (Mikko Jalas)	Whole system mapping & product service systems (Jeremy Faludi)			
13.00 Group work: Circular Economy Project	13.00 Group work: Circular Economy Project	13.00 Group work: Circular Economy Project	13.00 Group work: Circular Economy Project	13.00 Joint Exhibition at Väre
+production in workshops	+production in workshops	+production in workshops	+production in workshops	Lobby
+Tutoring (optional)	+Tutoring (optional)	+Tutoring (optional)	+Tutoring (optional)	& Farewell Party (in Kipsari)
Room: F101 & 102	Room: F101 & 102	Room: F101 & 102	Room: F101 & 102	
Group Dai Milestones	p forum post: Group foru ily insights Daily ins	um post: Group fo sights Daily	orum post: Ready for insights	exhibition!

TEACHING SESSIONS

Design in Circular Economy (1 Aug)

by Kirsi Niinimäki

Currently the material throughput in the system is fast and products are sent to landfill after very short use time. In the linear system (design-manufacturing-saleuse-dispose) we are wasting valuable materials in huge amounts. Not only materials, however, but also many other resources, for example water and energy needed for manufacturing are wasted if the product life-time is very short. It has been estimated that even 80% of all products turn into "waste" and are thrown away within the six first months. Products are not to made for last longa and be durable in the current linear model and might even be that consumers are not even looking for the best guality when they are purchasing new products. They might search more fashionable items, newest trends, change and fun and through buying they are getting "emotional highs" and therefore they are tight to frequent buying new stuff which are meaningful for them for very short time, which after products are easy to discard. Circular economy proposes a change for this and the aim is to slow down and create better sustainability balance in the system level of production-consumption. In the future products need to be designed so that they last longer, they are repairable perhaps upgradable and at the end of their life the materials are possible to recycle back to industrial production (closing the material loop). This approach changes the business logic, the design and manufacturing processes as well as the aesthetic of product world and moreover the consumption practices.





Complexity science and speculative design practices (1 Aug)

by Jeongki Lim

As we examine the world through a circularity framework, what cross-disciplinary ideas and tools can be useful? During this session, we will look at the theories and methods that can help us better understand the inscrutable phenomena in research and engage key research stakeholders through speculative practices.

Sustainable cities and urban metabolism (2 Aug)

by Peter Ortner and Lynette Cheah

In this interactive session, we will introduce the growth of cities and the study of urban metabolism (UM). UM is a framework to quantify the inflows, outflows, and accumulation of resources, such as materials, energy and water, in a metropolitan area. The study of resource stocks and flow exchanges in cities offers a perspective for urban systems analysis, and to take deliberate next steps towards achieving self-sufficiency, efficiency, and resilience.

Circular city scenarios (2 Aug)

by Peter Ortner

This interactive session introduces the history of scenarios in urban planning and design and engages students with a hands-on scenario creation exercise for circular economy transitions. Scenarios are used in urban and environmental modelling (and originally in military planning) to prepare for multiple eventualities and to develop pathways to attain complex goals. While the history of scenarios for urbanism is mixed, with examples of misuse, we will discuss how scenarios can foster transparency and consensus for transitions to a circular economy. Building a simple scenario together in silico.app will help students understand the logic behind scenario creation and appreciate the need for transparency on data sources, assumptions and results.

Introduction to Product Life Cycle thinking (3 Aug)

by Mei Xuan Tan, via Zoom

In this introduction, students will get to learn about Life Cycle Thinking and determine the energy "hotspots" of a product. They will be introduced to the Life Cycle Assessment (LCA) of a product based on the type of material used, and the amount of energy required during the "use" phase of the product. Students will get to discuss ways to improve a product through analysis and design.

Product Disassembly of Coffee Machine Workshop (3 Aug)

by Wei Lek Kwan, via Zoom co-teachers: Mei Xuan Tan, Maggie Pee, Apple Koh

In this interactive session, we will introduce the growth of cities and the study of urban Students will apply what they have learnt in "Introduction to Product Life Cycle Thinking" to examine different brands of capsule-type coffee machines. This interactive online session involves a virtual disassembly of coffee machine to take a closer look at the inner parts and design of coffee machines. Energy consumption during the usage of the coffee machine will be measured and analyzed. Students will discuss how energy consumption during usage can be further optimized.

Biomimicry: Patterns, cycles, systems and functions (4 Aug)

by David Sánchez Ruano

This session will involve the acquisition of a naturalistic lens. Patterns, Cycles, Systems and functions found in our fellow species will be the inspiration to develop ideas or enchance the ones that already been displayed. The biomimicry method will help to confirm circularity in your concepts and evaluate them through the life's principles. As a remark, we going to question trends on biomateriality and symbiosis.





From DIY materials to industrial symbiosis (5 Aug)

by Luca Alessandrini

We will talk about novel materials from organic waste developed by designers through a DIY materials tinkering approach. A wide number of case studies will be shown highlighting the processes involved in developing inspiring and inventive materials drafts able to question multiple waste streams proposing inventive and sustainable solutions. Among those, projects proposing disruptive approaches endorsing industrial symbiosis solutions will be presented as an introduction of this concept and its novel relation with the new generation designers' practice.

Panel Discussion (5 Aug)

Geographical Wisdom: The many faces of Circular Economy

Moderators: Elif E. Öztekin & Natalia Moreira

Circular Economy can be manifested in diverse ways in different contexts. The differences in system relations and dynamics, in sectoral relations, in regulations and policy limitations, in cultures of production and consumption practices affect how circularity is conceptualized, planned, and constructed. In this panel session, the lecturers of the summer school share their research findings, opinions, and experiences on how Circular Economy is approached and practiced in different contexts and to what extent. We will discuss the potentials and limitations that Circular Economy holds in different geographies and scales with the aim of linking learnings and discovering future opportunities.

Tools and strategies for designing sustainable products, spaces and processes (8 Aug)

By Erminia D'Itria, via Zoom & Pedro Damián Pacheco Vásquez

This session will address design strategies and toolkits to design products, spaces and services that minimize waste and maximize resources. The session starts by defining core principles such as modularity, prototyping, prefabrication, collaboration and deconstruction. Then, cases studies are presented that demonstrate how these strategies and toolkits are applied to create sustainable products, spaces and processes.

Participatory Design Practices (9 Aug)

by Cynthia Lawson Jamarillo & Jeongki Lim

Who is 'designer' and what do we mean by 'participation'? As we envision a new type of economy through circular concepts, how can we seek to instill values of equity and justice in its process and outcome? This session will examine and critique the foundational concepts and practices of participatory design practices. Students will be asked to apply them to their research projects and develop a critical perspective on what meaningful roles the communities can actually play in the practices.

Design Justice II (9 Aug)

by Cynthia Lawson Jamarillo & Jeongki Lim

This workshop will draw from information and findings gathered through the online independent study on Design Justice I. This will be a generative session of creating speculative/scenarios where you will develop insights regarding your stakeholders, through a design justice lens.





Whole System Mapping (10 Aug)

by Jeremy Faludi

Whole System Mapping is a simple way to make systems thinking concrete and actionable; industry designers and engineers value it for driving innovation and sustainability, and sometimes also reducing costs. In it, you collaboratively draw a system map of your product, set priorities based on LCA & business strategy, then brainstorm solutions on the system map itself to provide more thorough and radical ideas. Finally, you choose winning ideas based on your priorities.

Product Service Systems (10 Aug)

by Jeremy Faludi

Designing for the circular economy requires new business models to make the physical product designs viable. There is a wide variety of different business models in product service systems (PSS). This workshop will be a short brainstorm session on a few different PSS types, to spur creative exploration.

INDIVIDUAL STUDIES

Available on myCourses.aalto.fi

Design for Regenerative Cultures (2 Aug)

Video lecture by Carlos Cobreros Rodríguez

The teaching session "Design for Regenerative Cultures" aims to expose the basis of reflection and questions necessary to address the current crisis situation, taking us by the hand to a critical reflection, which leads us to the approach of a paradigm shift where we evolve from a paradigm of reducing anthropogenic impact, from a paradigm of impact compensation, as proposed by sustainability, to a paradigm of positive impact, where we understand the development in combination with the achievement of welfare and happiness and always taking into account its burden on the natural environment and its environmental cost. In this sense, the design for regenerative cultures bets on the co-creation of processes that restore, renew or revitalize the socio-ecological environment from the reading of the place, its potential and from the community and collective capacity.

Scenarios for system changing (3 Aug)

Video lecture by Idil Gaziulusoy





Design Justice I (4 Aug)

Reading package and exercises by Caroline Dionne

Despite our best intentions as designers, designed "things" aren't neutral: design can be empowering, but it can also be exclusive or reinforce the oppressive structures of social inequities and inequalities (of race, gender, or class). This session will be devoted to a student-led set of explorations on the theme of Design Justice. First, students will engage individually in an online/asynchronous discussion of two selected essays. In teams, students will then conduct a swift research exercise to gather examples and precedents that speak to a design justice problem or cause (see detailed instruction packet). The findings gathered through this exercise will, in turn, serve as a point of departure for the speculative/scenario-building exercise "Design Justice II" on 9 August.

Co-design (5 Aug)

Video lecture by Sampsa Hyysalo

Sharing, rhythms and practices (8 Aug)

Video lecture by Mikko Jalas

Whole System Mapping, Product Service Systems(9 Aug)

Short videos by Jeremy Faludi

The materials of this sessions will serve as a basis for the face-to-face teaching session "Whole System Mapping & Product Service Systems" on 10 August.

GROUP TASK

the Summer School project



During the Summer School you will be provided with lectures, workshops, video lectures and reading materials which target three different levels of Circular Economy (CE):

- · Scenarios
- · Systems
- · Materials and products

As part of the group task, please consider all these three levels of the CE and decide on which one you will place the main focus of your project.

Do you want to design products which fit into a circular system? Do you want to create a system which enhances product longevity through repair and reuse services? Or do you want to concentrate on scenario building and how our future living environment and product world could enhance more resource efficiency?

Even if you focus on one individual level, please tackle and link all these levels in your group's work and reflect on them in your daily insights (submissions on myCourses.aalto.fi).



SCENARIOS

- Building scenarios and pathways towards desired future
- Designing the set of actions that would lead the societal change processes
- Understanding the roles of different actor groups in bringing about the desired changes
- Framing the supplementary relations between several change actions
- Framing the collaborative approach in implementing these change actions
- Radical transformations

Outcome: Scenario building - How do we live in a circular society in 2035?



SYSTEMS UNDERSTANDING

- Designing for circular system and designing Product-Service System, PSS
- Designing product lifetimes (understanding the circular system and designing several rounds)
- Understanding the importance of users/consumers in adoption of circular thinking
- Sustainable transformation

Outcome: Constructing a system concept for a CE



MATERIALS AND PRODUCTS IN CE

- Design tools and approaches
- Modular thinking, prefabrication and design for deconstruction as tools or strategies for designing sustainable products
- Extending the product use time through design

Outcome: Prototyping new solutions for product design

CIRCULAR ECONOMY PROJECT

- Please create your idea of the following scenario: How will the circular economy work in 2035?
 - Form a concept you want to work with as a group
 - Form your approach to circular economy:
 - (discuss) what interests do you have in relation to circular economy?
 - (frame) what is the problem you want to solve at the system level and/or at product design level as a group?
 - (envision) Are you interested in including scenario building into your approach? Which futures and large-scale changes do you target in the long-term?
- Construct a system concept for a certain specific product, its production, use, and recycling within a certain geographical context.
- Design a product that is suitable for the CE system and scenario you have created. Your approach can be presented visually and/or through prototype(s). Please remember that the most important aspect in product design for CE is to slow down (extend the use phase + new business models), close the material loop (recycling at the end), create a new system model and build products suitable for this new system.
- An exhibition will be assembled throughout the 2 weeks of the Summer School; it will present your group's process as well as your solution proposal. Each group will have enough space in the exhibition to share their evolving insights, their preliminary sketches and drafts, the system maps and visions which are the building blocks of your group's proposal. Therefore, please elaborate on your process and clearly present the problem you tackled and your approach to it, and showcase your solution.



If you have any further questions, do not hesitate to contact Aalto Summer School team!