

SPT-E1050 - Systems Thinking for Sustainable Living Environment, 5cr | Syllabus

Time: 27.10.2020-03.12.2020 | Tues-Thurs 13.15-16.15 (First Half) | Tues 8:30-12 Wed 9-12 (17 Nov - 2 Dec) | online at zoom <https://aalto.zoom.us/j/69059131005>

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Course Content:

The course addresses socio-ecological systems and changes in systems over time. It introduces theoretical foundations of the large-scale systemic principles and multi-dimensional interdependencies of sustainability. Key notions are derived from complex adaptive systems and transition theories. These concepts and systems thinking are used to analyse design approaches towards circular economy and sustainable living environments and to learn to anticipate unintended consequences of sustainability solutions.

- Lectures including shared lectures with the programme Spatial Planning and Transportation (SPT) at Aalto ENG.
- Peer-to-peer teaching
- Readings to support classroom activities, course essay and exercises.
- Student group work including final presentation and written report.

Assessment criteria:

- individual assignments
- active presence in class/online platforms
- peer-to-peer teaching
- group assignment

Workload:

5 ECTS = 135 hours in total

- Lectures (40h)
- Teamwork (50h)
- Literature, individual/group work (35h)
- Personal/group reflection (10h)

Assignments:

- **SPT Group Assignment** - Please see the *Assignments* section of MyCourses for further Information on groups and assignment brief/Instructions.

Schedule of Lectures + Pre-Readings:

Date Lecture theme & pre-readings

Tuesday, 27 October: Introduction; Planetary boundaries; Systems thinking frameworks

Literature: Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., ... & Folke, C. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223). Access to PDF [here](#).

Thursday, 29 October: Socio-technical transitions - Transition and innovation studies as system studies

Guest lecturer: Paula Kivimaa, Finnish Environment Institute

Literature: Geels, F. W. (2020). Micro-foundations of the multi-level perspective on socio-technical transitions: Developing a multi-dimensional model of agency through crossovers between social constructivism, evolutionary economics and neo-institutional theory. *Technological Forecasting and Social Change*, 152, 119894. Access article on <https://aalto.finna.fi>

Tuesday, 3 November: Core concepts of systems thinking

Guest lecturer: Idil Gaziulusoy, Aalto University Department of Design

Literature: • Meadows, D. H. (2008). *Thinking in systems: A primer*. Chelsea green publishing. Ch2 A Brief Visit to the Systems Zoo. Access PDF [here](#).
• Meadows, D. (1999). Leverage points - Places to intervene in a system. Sustainability Institute. Access PDF [here](#).

Thursday, 5 November: Urban metabolism: Water, energy, materials and nutrient flows in the city

Guest lecturers: Alpo Tani, City of Helsinki; Kata Fodor, Aalto University Department of Design

- Literature: Kennedy, C., Cuddihy, J., & Engel-Yan, J. (2007). The changing metabolism of cities. *Journal of industrial ecology*, 11(2), 43-59. PDF [here](#).
- Carbon-Neutral Helsinki 2035. Access PDF [here](#), and read about the city's SDG work [here](#).

Tuesday, 10 November: Systems of production and consumption, rebound effect, economic growth and capitalism as system condition

Guest lecturer: Jukka Heinonen, University of Iceland, Faculty of Civil and Environmental Engineering

Literature: Czepkiewicz, M., Heinonen, J., & Ottelin, J. (2018). Why do urbanites travel more than do others? A review of associations between urban form and long-distance leisure travel. *Environmental Research Letters*, 13(7), 073001. (PDF [here](#))

Thursday, 12 November: Regenerative design - partnering with places and nature

Guest lecturer: Katri Einola, Creative Sustainability student, Aalto University Department of Design

Abigail Garbett, Uppsala University (CEMUS) / UK Urban Ecology Forum

Literature: • Regeneration (2016) Ch2 Understanding place. In: *Regenerative Development and Design: A Framework for Evolving Sustainability*. pp33-60. ([link](#)) Access from <https://aalto.finna.fi/>
• Watch a video by Daniel Wahl at <https://www.youtube.com/watch?v=qQUqna4ObxQ>
• Additional: Soule: What is conversation biology. ([link](#)) Access from aalto.finna.fi

SPLIT streams / SPT schedule:

Tuesday, 17 November: 8:30-12:00

- *Brief history of sustainability thinking in urban planning – case Helsinki, Alpo Tani*
- *Group based discussions and outline of schedule/final project.*

Wednesday, 18 November: 9:00-12:00

Guest Lecturer (TBC): Pirjo Jantunen, Business Development manager

- Energy systems and energy transition*
- Energy efficiency improvement as a part of climate change mitigation*

- Discussion and reflections on target areas*

Tuesday, 24 November: 8:30-12:00

Guest Lecturers (TBC): Helen Henna Hovi, Project manager, City of Helsinki // Anton Silvo, traffic engineer, City of Helsinki

- Traffic planning and climate change mitigation*
- Cycling planning*
- Public transport systems*

- Discussion and reflections on target areas*

Wednesday, 25 November: 9:00-12:00

Guest Lecturers (TBC) Jessica Karhu, Project manager, FGBC // Jouni Heinänen, Deputy business unite manager, WSP-Finland

- Planning of circular economy*
- Climate change adaption and biodiversity in cities*

- Discussion and reflections on target areas*

Tuesday, 1 December: 8:30-12:00

Group work facilitation session

Wednesday, 2 December: 9:00-12:00

Group work presentations, class discussion, and feedback