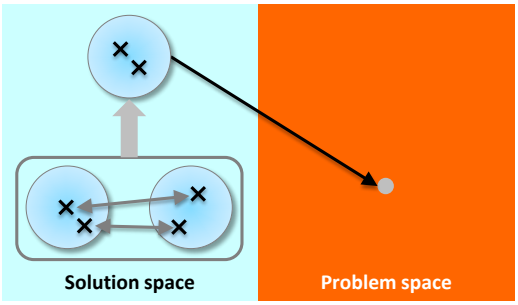
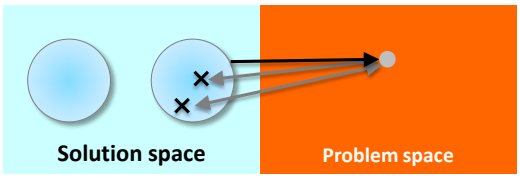
Course syllabus for

# P51: Transdisciplinary Approach to Circular Economy Research

Syllabus adopted 2020-08-13 by Professor Bengt-Göran Rosén, Produktion2030 Head of Education




Transdisciplinary 1




Transdisciplinary 2

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| Credits | 2 hec |
| Grading scale | Satisfactory/not satisfactory |
| Education cycle | Third-cycle |
| Examiner | Tomohiko Sakao, Linköping University |
| Eligibility | A Master's degree in a relevant subject, e.g., production engineering, product development, environmental sustainability, or equivalent. Knowledge on Circular Economy is required. Experience of research related to Circular Economy at least in one subject as a PhD student for a period of more than one year (thereby experience of opportunities and challenges within the subject) is recommended. Scientific papers published and submitted (e.g. a journal or conference paper) by a course applicant will be evaluated for course admission (only an abstract will be fine in case under review, considering the confidentiality). |
| Aim | The course aims at facilitating the participant to learn the interplays between different areas relevant to Circular Economy and thereby to broaden the view enabling to recognize larger parts relevant to the challenge in real life. The areas are 1) business model, 2) governmental policy, and 3) product/service design and production (incl. remanufacturing): if a participant's |

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| | area is user behaviour or supply chain management, it can be added. The course also aims at supporting the participant to carry out or reflect upon his/her research with a transdisciplinary approach (see the Figure above taken from one of the must literature below). |
| Intended learning outcomes | After completion of the course the course participant should be able to demonstrate advanced knowledge of various disciplines of Circular Economy through ability<br>• to refer to existing knowledge in different disciplines,<br>• to relate the existing knowledge above to a context of the PhD candidate's research (i.e. with a transdisciplinary approach), and<br>• to reflect on the applicability of the knowledge learnt for her or his research. |
| Course content | This intensive course gives opportunities to discuss and reflect upon different disciplines relevant to Circular Economy research with peer PhD students working in different areas, and to discuss with globally leading researchers related to Circular Economy. It will consist mainly of lectures and group discussions (groups to be formulated according to the number of registrants). All in all, this course will be unique in its focus and interactions with peer PhD students and internationally well-recognized researchers. There will be three group discussions (during the course) and homework (to be carried out before and after the course). |
| Course organisation | Two full days (three days in calendar: 21st to 23rd of October, 2020) course based on the following activities (this course will be held physically, if the corona-related circumstance allows – on the distance mode, if not):<br>**Group discussion 1:** Each person will derive and present needs on the other areas in order for more efficient transition to a Circular Economy to be realized. E.g., a participant researching on business model will derive needs on governmental policy (e.g. repeal a specific regulation hindering a circular business model), product/service design (e.g. design more durable products enabling a long-term service level agreement model), user behaviour (e.g. stopping vandalism on a shared product facilitating a product sharing model), and supply chain management. These needs will be discussed with peers in the group to share the knowledge from different research. This |

activity requires research experience in his/her own research area.

**Group discussion 2:** Each person will find potential resolutions to meet the needs given from the other areas in order for more efficient transition to a Circular Economy to be realized. E.g., a person in business model will find how to address the needs given from governmental policy, product/service design, user behaviour, and supply chain management. In case a participant wants to collect more resolutions, he/she can use some time searching relevant literature during the course.

**Group discussion 3:** Each person will present the potential resolutions for the needs to experts and peers in different disciplines. Who will be the experts giving feedbacks needs (not necessarily during Group discussion 3) to be confirmed (planned: Tomohiko Sakao, Carl Dalhammar, Erik Sundin, Mattias Lindahl and Christian Kowalkowski).

**Homework (before course start):**

- Read the must literature (see below).
- Record and submit a three-minute pitch of the area and topic of his/her own research in relation to transdisciplinary approaches to Circular Economy research (one pager in PowerPoint with recorded voice narration is recommended). This should be useful for all the participants to know each other's work.
- Watch the video movies submitted from the other students.
- Create a list of needs from your area to the other areas. To be used in Group discussion 1.

Examination

A successful completion of this course will be judged by the examiner on the following:

- Submission of the three-minute video.
- Active participation and contribution to the whole program including the group discussions.
- A follow-up report focused on the participant's own research context. This report should be between 500 and 1,000 words. Typically, this could be used for a part of a scientific paper by the Ph.D. student in the future.

Literature

To be used in the lectures ("must" literature):

General

- Sakao, T. and Brambila-Macias, S. A. (2018). "Do we share an understanding of transdisciplinarity in environmental sustainability research?" Journal of Cleaner Production. https://doi.org/10.1016/j.jclepro.2017.09.226

*This literature defines multi-, inter-, and trans-disciplinary research, and explains several research works in ecodesign as examples.*

On design and remanufacturing

- Sundin, E., & Bras, B. (2005). Making functional sales environmentally and economically beneficial through product remanufacturing. Journal of Cleaner Production. https://doi.org/10.1016/j.jclepro.2004.04.006

On business models

- Kindström, D., & Kowalkowski, C. (2014). Service innovation in product-centric firms: a multidimensional business model perspective. Journal of Business & Industrial Marketing. https://doi.org/10.1108/Jbim-08-2013-0165
  *The study provides a business model framework and perspective on innovation and business development, particularly in a product-service context, thereby presenting new insights regarding issues such as circularity and servitization.*

On governmental policy

- Wilts, H. and O'Brien, M. (2019). "A Policy Mix for Resource Efficiency in the EU: key Instruments, Challenges and Research Needs," Ecological Economics. https://doi.org/10.1016/j.ecolecon.2018.05.004
  *The article provides a conceptual framework for defining, assessing and developing resource efficiency policy mixes in an EU context.*

For further references

1. Ceschin, F., & Gaziulusoy, I. (2016) Evolution of design for sustainability: From product design to design for system innovations and transitions. Design Studies. https://doi.org/10.1016/j.destud.2016.09.002
   *This literature overviews the expansion of the disciplines to be covered regarding design for sustainability.*
2. Helkkula, A., Kowalkowski, C., and Tronvoll, B. (2018), "Archetypes of service innovation: Implications for value cocreation," Journal of Service Research. https://doi.org/10.1177/1094670517746776
3. Milios, L. (2018). "Advancing to a Circular Economy: three essential ingredients for a comprehensive policy mix," Sustainability Science. https://doi.org/10.1007/s11625-017-0502-9
   *The article provides an overview of existing and*

*proposed EU policies for the CE, and discusses 'policy gaps' where more policy interventions are needed.*