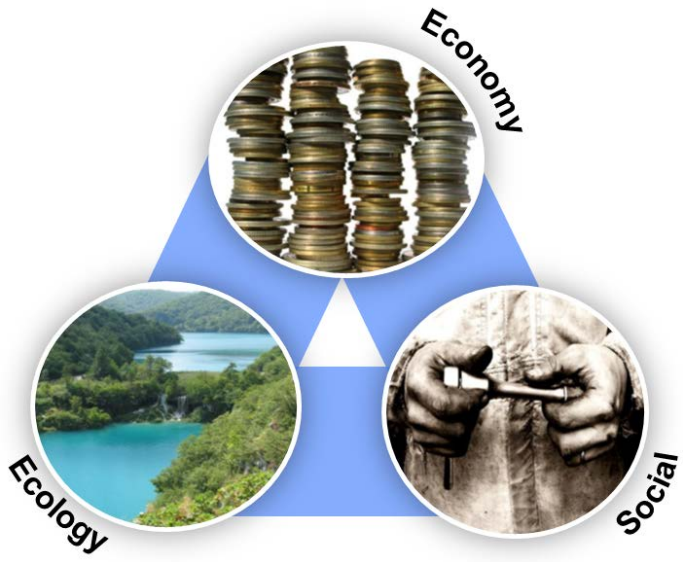
Syllabus for



P10 – Sustainable Development

Credits	4.0
Examiner	Björn Johansson, Industrial and Materials Science, Chalmers University of Technology bjorn.johansson@chalmers.se +46 (0) 73 079 11 89
Contact	Mélanie Despeisse Industrial and Materials Science, Chalmers University of Technology melanie.despeisse@chalmers.se +46 (0) 73 387 32 09
Target group	PhD Students mainly, other applicants may be welcome if there is space
Aim	The course aims to increase awareness regarding sustainability by addressing a life-cycle perspective of sustainability in general and in specifics from three aspects, social, environmental and economic viewpoints within the core research area of each participant.

Teachers / tutors

Björn Johansson is a professor at Industrial and Materials Science, Chalmers University of Technology. One of his main responsibilities at Chalmers within the area of advance Production was to increase the awareness of about 200 researchers on sustainability over a lifecycle perspective of their own research field by coaching them. He is also teaching sustainable development on bachelor and master level courses. His research also aims at utilizing digitalization and virtual tools to achieve more sustainable manufacturing industries. For example methodologies and tools for analyzing production impacts and implications throughout a product lifecycle, addressing social, environmental and economic key performance indicators to improve the real world performance towards circular economy.

Mélanie Despeisse is Assistant Professor at the Industrial and Materials Science department, Chalmers University of Technology. Her research focuses on the relationship between industry and environmental sustainability at various organizational levels, from operational efficiency to corporate social responsibility. The aim of her research is to develop tools and methods to help companies implementing concepts such as eco-efficiency and circularity to create sustainable value for society.

Erik Sundin is a professor at Manufacturing Engineering, Linköping University. He has performed research and teaching within the areas of remanufacturing, recycling, design for remanufacturing, design for the environment since year 2000. Currently he holds a course on master level called Sustainable Manufacturing. Erik is now leading two remanufacturing research projects where one is including in Production 2020 called RemProLife. In addition he is also leading a sustainable manufacturing project dealing with sustainable industrial cleaning.

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Fee for industrial members	5000 SEK
Learning outcomes	Upon completion of the course, students should be able to: • Recognise the importance of collaboration for sustainable development in general, and for each participant individually (will be measured!). • Explain the triple bottom line and the relation between economic, social, and environmental dimensions. • Scope and position their individual research area in a wider context addressing the triple bottom line and life cycle thinking. • Communicate effectively their research both in writing and oral presentations with clear connections to sustainability and life cycle thinking. • Describe how products can be designed for recycling and/or remanufacturing. • Identify and motivate the sustainable benefits of remanufacturing and recycling from a life cycle perspective. • Describe the underlying concept of Life Cycle Assessment (LCA) and the building blocks for inventory analysis, impact assessment and interpretation. • Explain the limitations of and the requirements for carrying out an LCA study. • Describe the specific attributes of Social Life Cycle Assessment as well as its benefits and limitations • Identify potential social impacts of products from a life cycle perspective and discuss possible trade-offs with environmental impacts.
Contents	The course 'Sustainable Development' will address a life cycle perspective of sustainability in general, and in specifics from three viewpoints—environmental, social, economic. The core area of work for each PhD student will be their own research domain while addressing sustainability from a life cycle perspective and in each dimension of the triple bottom line. The PhD students will identify and connect relevant societal challenges to their own research topics in order to strengthen their understanding of the wider sustainability implications within their field. Three physical meetings are planned (lunch to lunch), in addition to work in-between the meetings.

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Organisation

First meeting, Gothenburg 10-11 Sept. Lunch / lunch

The first physical meeting is initiated with a short round table to let each person introduce themselves and a one-pager description (300 words) of their research area which should be prepared in advance.

Lecture on sustainability in general with discussions and industry examples to reflect and appreciate the complexity and multi-faceted nature of the problems at hand.

Concepts maps conducted by all PhD students in order to measure their current position and understanding of what sustainability means for their own research.

After the first meeting, feedback on the 0,5 pager and concept map.

Task for 2nd meeting add sustainability aspects to the 0,5 pager.

Second meeting, Linköping 8-9 Oct. Lunch / lunch

Bring updated one-pager (now 500 words).

This meeting will focus on the three dimensions of sustainability through guest lectures, 2 x 45 minutes on each topic (economy, environment, social) with interactive sessions and discussions around the PhD students' own research questions and hand-ins.

Feedback and updated one-pager for the last meeting (up to 2 pages) with a more concrete and structured approach on how to tackle sustainability in their specific research field.

Third meeting, Gothenburg 5-6 Nov. Lunch / lunch

The PhD students should have a 2-page document which will be presented and discussed in smaller groups (each student gets 15 minutes to present and 10 minutes to discuss).

The last meeting will also bring up the complexity and overall dilemma with sustainability such as ethics, morals, social norms, culture, religion, laws, trade-offs, etc.

A new concept map will be done as a final exercise and will be compared to the initial one made when starting the course to see/measure their progression.

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	The written and presented material will be useful for papers and theses in a near future, especially in regards to societal challenges and UN goals relevant for their research. Performing effective sustainability research will lead to sustainable development!
Literature	Handouts and materials from each meeting.
Examination	Partake actively on all three meetings. Hand in tasks in time and demonstrate mature reflection on their own contribution to sustainability research will give grade “Pass” on the course.

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